THE

LARYNGOSCOPE.

VOL. XXIX. ST. LOUIS, MAY, 1919. No. 5

ORIGINAL COMMUNICATIONS.

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TYPES OF ORBITAL ABSCESS AND EXOPHTHALMOS DUE TO INTRANASAL SUPPURATIVE PROCESSES.

DR. DERRICK T. VAIL, Cincinnati, Ohio.

Twenty-five or thirty years ago nearly all abscess formations of the orbit were diagnosed as either primary or metastatic. The primary form was idiopathic. The metastatic was due to a septic embolus lodging in a capillary of the orbit behind the eyeball carried there by the arterial blood stream and followed by abscess formation with all the classical symptoms: "tumor, rubor and dolor."

The process was variously denominated "abscess of the orbit," "phlegmon of the orbit," "orbital cellulitis" or "pyemic abscess." About that time the pathogenesis underwent a slight change of view and "septic thrombosis" of the orbital veins or "orbital thrombosis" occupied the stage. The pathological process was then thought to be due to infection of the venous blood of one of the orbital veins from pathogenic bacteria which had gained access to the venous current draining some contiguously infected accessory nasal sinus or from some remote septic process elsewhere in the body, and this view is still held to be the case by many today.

The cases reported in this short paper and others of like nature encountered by the essayist argue that neither of these views is correct. In each of the following cases it will be noted a hole was demonstrated to exist in the periosteum of the orbit at the time

of operation, demonstrating that the pus had broken through from under it. If septic embolism or septic thrombosis was the *causus morbi* no such hole or laceration of the resisting periosteum would be present. The true conception, therefore, seems to be that the abscess process first begins in a locked-up accessory nasal sinus; that as swelling takes place the least resisting wall of that sinus gives way either by necrosis of its thin, bony shell or from increased tension within the affected sinus and the pus finds a way out of its sinus-confines into the adjacent space, wherever that happens to be. If the wall of the cerebral fossa gives way there is a localized pachymeningitis and an extra-dural abscess produced, causing the same train of symptoms we note when extra-dural abscess occurs in mastoid disease; languor, headache, aprosexia, etc. If this extra-dural abscess is of the fulminating type, or if

FIG. 1.

Case I. Acute exophthalmos from orbital abscess right eye, followed by thrombosis, first of the right cavernous sinus, then of the left, and finally of all the anterior cerebral sinuses with general septic leptomeningitis. Death.

the dura ulcerates and gives way the pus will flood the brain, causing general septic leptomeningitis, or more often abscess of the frontal lobe. If the pus from the primarily affected accessory nasal sinus breaks through the orbital wall of the sinus the same pathological process results, viz., first, elevation of the periosteum of the orbit and later on the periosteum bursts and the pus is free to flood the tissues of the orbit, resulting in orbital abscess. The chill and rise of temperature announce that a new area is invaded and about to be abscessed. Nature's usual program is to evacuate the pus of an acute sinus abscess through the wall of the nasal chamber, and a spontaneous cure results. We often hear a

patient recite how he had a violent headache on one side or pain about his eye and temple, during or after a severe cold or attack of influenza, and that all at once there was a gush of pus from his nose. "Something broke," he says, and the relief was immediate. A search in the nose of such a patient after recovery will reveal very often a perfectly normal structure throughout.

Here is a case in point:

A medical man aged 40 was taken with the grippe in 1914. Middle ear and mastoid complications set in on the right side. Two myringotomies and finally a mastoidectomy brought about a cure. During this siege I ordered X-ray pictures showing his anterior accessory nasal sinuses, as he complained of much pain over the right eye corresponding to the floor of the frontal sinus

FIG. 2.

Case II. Acute orbital abscess and exophthalmos right eye and abscess of septum narium with complete sloughing of cartilaginous septum due to abscess of right posterior ethmoidal sinus; enucleation. Final recovery.

at the upper inner angle of the right orbit. The plates came back showing the large right frontal sinus totally dark, while that of the left was very bright and clear. Diagnosis of acute empyema of the right frontal was very positive, but patient was too sick with his mastoid trouble to have any nasal surgery. In five days there was a gush of bloody pus from his right nostril and his symptoms were immediately relieved. X-ray plates taken later showed a perfectly clear sinus on the right side as well as on the left. Five years have passed since then and he has never had a recurrence or the slightest symptom of further trouble.

If the pus from the storm-brewing sinus breaks through the orbital wall creating orbital abscess there may be a speedy recov-

ery from the swollen nasal mucosa, for the pus then has unloaded itself in the orbit and the turbinated regions as viewed with the rhinoscope are in such cases not very abnormal in appearance. This finding will throw the examiner off the track, for he naturally expects evidence of sinus disease by intranasal inspection. The fact is, he is too late in his examination, for the pus has already escaped into the orbit, and the turbinals, relieved of pressure and congestion, speedily resume a normal or near-normal appearance. Much of the pus that in this way floods the loose tissue of the orbit behind the eyeball is carried away by rapid absorption into the veins and lymphatics, but invariably, and in in a few hours, there occurs the deep, boring pain, the chill, the prostration, the high temperature and the exophthalmos with edematous eyelids, altogether producing a striking clinical picture. The position of the proptosed eyeball usually declares which sinus in the nose was the seat of the primary abscess.

In this paper I shall report four cases of exophthalmos from abscess of nasal accessory sinuses, each being a type for a different sinus. They are:

I. Exophthalmos and Thrombosis of Cavernous Sinus, right eye from Sphenoid abscess.

II. Exophthalmos from abscess of the posterior ethmoid sinus in which the eyeball was pushed straight forward.

III. Exophthalmos from abscess of the anterior ethmoid sinuses in which the eyeball was extruded forward and towards the temple.

IV. Exophthalmos from abscess of the frontal sinus in which the eyeball was extruded to less extent and pushed downward.

It so happens that in each of these four cases the right eye was affected and it is a curious fact that in my practice the right eye was involved in every instance excepting one among twelve cases that I can recall.

Case 1. Miss E. W., age 27. *History:* Always had pain over right eye during menstrual period, but the eye never was inflamed before.

Present Illness: On September 9, 1915, headaches set in so severely that the patient became prostrated; had a severe chill, which was repeated on the following day. Twelve hours after the chill of September 16 the family physician brought her to my office because of exophthalmos and chemosis of right eye. Patient never had suppuration from nose or ear.

Examination: Temperature 101.2. Pulse 104. Pale and anxious expression. Rhinoscopic examination entirely negative.

Slight ulcerative tonsilitis. Right eyeball is pushed straight forward at least 15 mm. and fixed. Right pupil dilated two-thirds and very sluggish in reaction. Vision, counts fingers at two feet; field of vision dull and very limited. Fundus much congested, veins dark and distended. Optic disc very hyperaemic. Left eye negative, vision 20/20.

September 18: Swollen eyelids; cornea almost hidden under chemosis; tissues very tense and tender; eye blind. Severe chill followed by temperature 104.5; beginning edema of left orbital tissus; patient in a very bad way, unconscious and moaning. Deep incision at upper inner angle of right orbit evacuated half ounce ill-smelling, dark fluid. Vertical external canthotomy was per-

FIG. 3.
Case III. Acute exophthalmos from abscess of right orbit due to recrudescence of a chronic empyema of the anterior ethmoidal cells in atrophic rhinitis. Death from supposed abscess of the brain.

formed to relieve pressure; probing of the ethmoid region through the incision failed to encounter rough bone; deep probing encountered bone at nasal side of orbital apex, proving that pus had broken through the periosteum from beneath. Patient rallied after operation and became partly conscious, but soon sank in a state of coma and died four hours afterwards.

The post mortem was conducted the next day by my son, H. H. Vail, at that time a student at the Harvard Medical School, who was at home on a visit. I first desired to see if it were possible to drill into the cavernous sinus through the nose as suggested by Langworthy of Dubuque (see Wood's Encyclopedia of Ophthalmology, Vol. III, pp. 1807-1809). I had no trouble to bore right into the right cavernous by following the directions laid down by Lang-

worthy (*l. c.*), but at the post mortem we saw the futility of such a procedure being effective *in vivo,* for the picture was that of solid septic thrombosis. The venous blood of both cavernous sinuses, together with that of the community sinuses, in fact, of all of the large venous channels of the anterior and middle cerebral fossa was stagnant with ropy clots shot with pus. Moreover, there was a general anterior septic leptomeningitis involving the membranes of both frontal and temperosphenoidal lobes. The orbital wall of the right sphenoidal cavity was black with foul necrosis; pus had burrowed from this sinus into the apex of the orbit, from whence the ophthalmic vein was infected, soon followed by thrombosis of the right cavernous sinus and extending to the other venous channels as reported. The picture (Fig. 1) was taken during life just before operating.

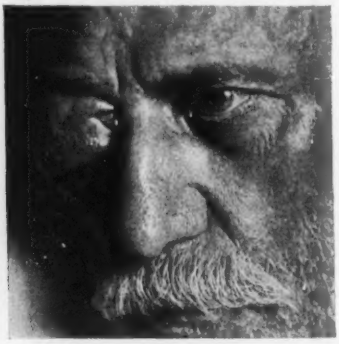

FIG. 4.

CASE IV. Acute exophthalmos from orbital abscess, due to empyema of the right frontal sinus. The eyeball not markedly extruded, but dislocated downward and laterally. Recovery.

Case 2. Mrs. E. C., age 26. Patient of my partner, Dr. F. W. Lamb.

History: August 31, 1917: Has had purulent discharge from right nares for five years. Five days ago took "cold" in the head and two days ago right eye became swollen.

Examination: Marked edema of right eyelids and conjunctiva. Exophthalmos present; movements of right eyeball restricted in all directions. Vision: Finger movements only. The eyeball is pushed straight forward.

Operation by Dr. Lamb August 31. General Anaesthetic. Deep incision made through the eyelid above and below internal rectus

muscle. Probing encountered exposed bone through a periosteal rent corresponding to the posterior ethmoid cells. Pus flowed from these incisions and from the nose in considerable quantity for twenty-four hours. Syringing through the incisions permitted the water to pass freely into the nose.

September 3: Large, baggy abscess of septum narium on the right side. Incision rewarded by free discharge of yellow, offensive pus which by microscopic examination showed offending organism to be an encapsulated diplococcus (pneumococcus). The posterior ethmoid cells being adjacent to the vomer, evidently furnished an outlet of pus under the periosteum of the septum. (Query: Is not abscess of the septum due to Sphenoidal or Posterior Ethmoidal Empyema?)

September 25: *Operation* by F. W. Lamb: Ethmoid cells right side exenterated; necrosis of bone encountered; exophthalmos still marked; cornea has sloughed; discharge continues unabated. Left eye normal. Vision 20/20.

October 6: *Operation* by D. T. Vail. Right eye enucleated; probing the depths of the wound on nasal side permitted the probe to pass freely in the posterior ethmoidal cell region near the apex of the orbit.

The cartilaginous septum came away, leaving the mucosa and no perforation, but the patient has a marked nasal deformity (see picture, Fig. 2). The discharge from the orbit and nose continued for several months and there were repeated light curettements performed both by Dr. Lamb and me, and finally, in January, 1918, the parts healed.

March 28, 1918. There is marked shrinking of the orbital tissues, so much so that an artificial eye cannot be worn. Dr. Lamb performed a successful plastic operation for reception of a glass eye, which patient wears now, with great improvement to her looks and considerable satisfaction. The appearance of the eye during the height of her trouble is shown in the photo-cut, Fig. 2.

Case 3. Dr. J. W. C., age 56. *History:* Jan. 8, 1918. A week ago noticed pain in the right side of the face and region of the right ethmoid. Throat was inflamed and tonsils were swollen. The home physician performed uvulectomy for relief of edema of the soft palate. Two days ago right eyeball became bulged forward and toward the temple. The vision was soon blotted out.

Examination: Jan. 9. Temperature 99, pulse 100. The right eye is protruded forward and outward and is fixed; pupil is dilated and fixed; vision *nil;* cornea clear; optic disc swollen and vessels tortuous and distended; nose reveals crust formation and the right middle nasal fossa obliterated by swollen ethmoid body.

Operation Jan. 10. Exenteration of right ethmoidal cells under cocaine; probing demonstrated the os planum absent and probe passes into the orbital cavity. Some bloody pus escaped, but patient was not relieved, and so on the following day, January 11, under general anaesthetic the orbit was entered by incisions carried through the upper and lower eyelids above and below the internal rectus muscle. Probe passed through a rent in the periosteum into nasal cavity; syringing after the operation daily for two weeks after permitted the fluid to pass freely through the orbital incision into the nose. The convalescence was slow and stormy, much prostration and headache, with transitory paralysis of left arm and numbness and weakness of this member complained of at all times. The clinical picture was that of extradural or frontal lobe abscess. Consultation with two physicians, one a neurologist, failed to locate any definite cerebral lesion.

February 12. After slow but positive improvement patient suddenly developed a backset. The orbital tissues were again swollen and the eye was extruded nearly out of the socket. Curetting through the old incision evacuated large masses of necrotic tissue. Evidently all the muscles of the orbit had necrosed. Patient begged to be sent home and soon after his arrival there he sank in a comatose state and died. The appearance of his eye at the height of his trouble is shown in Fig. 3.

Case 4. J. L., age 52. *History:* On August 25, 1917, was seized with severe pain in the right eye and eyebrow. Fifteen years ago had a similar attack of pain and it subsided spontaneously. Patient thought this attack would subside, too, but was brought to my office on September 14, 1917, with pain still a prominent symptom and swelling of the upper eyelid.

Examination: There is much edema of the right side of the forehead and also of the right upper eyelid. Some chemosis present and some exophthalmos, but not marked. The eyeball is displaced forward, downward and laterally away from the upper inner angle of the orbit; Vision unaffected; Ophthalmoscopic examination negative. There is fluctuation over the right superciliary ridge. The upper straits of the nose contains creamy pus and a trail of the same is seen on the back wall of the pharynx on the right side.

Operation: September 14. Incision below inner end of the right eyebrow under novocaine liberated an ounce or so of thick pus. The periosteum had been stripped up and perforated by pus burrowing. Search with a probe disclosed a bone fistula leading from the external abscess into the frontal sinus.

September 26. The right ethmoidal labyrinth was exenterated and Good's rasp used to enlarge the frontonasal duct. I was able after the operation to pass a large eustachian catheter into the right frontal sinus and to wash out this cavity, the outflow taking place through the incision under the brow. I was able also to pack a long strip of gauze into the frontal sinus through the nose route. The case is uninteresting from this on and because of the slow and at times stormy progress. He stoutly refused anaesthetic operation. I had designs on him for a Lothrop operation, but he answered me nay. After several apparent cures and a repetition of the symptoms in milder degree he finally ceased coming. His vision in the affected eye was at all times normal. The appearance of his eye is shown in Fig. 4.

Concluding Remarks: The Wassermann was negative in each of these cases. The urine was free from sugar and albumen in each. Each of them carried a chronic bone disease of an accessory sinus of the right side of the nose for months and years before the eye storm. Two of them died. Three were blind in the affected eye within seventy-two hours after the onset.

Comment: It would seem that the rational surgical procedure in all cases of acute exophthalmos from abscess arising from accessory nasal sinuses would be to evacuate the pus by intranasal operation and desist from the deep incisions into the orbit through the eyelids. This was done in case III, but failed, and I very much doubt that any operation will reveal pus until after three days at least have elapsed, and usually five or six, during which time the eye is usually destroyed. In the days before the modern ethmoid or sphenoid operation I incised orbital abscess externally in seven cases and six of them recovered with normal vision; one died from brain abscess. Six of the seven were young subjects, adolescents who had developed the abscesses during or following attacks of tonsilitis, measles or scarlet fever.

24 East Eighth St.

THE RECONSTRUCTION OF THE MASTOID WOUND CAVITY BY THE USE OF BONE GRAFTS AND CHIPS.

DR. W. P. EAGLETON, M. D., Newark, N. J.

*Case 1.** Transplantation of Bone Graft and Bone Chips into operative cavity at Primary Mastoid operation.

On September 30, 1918, following a simple mastoid operation, the sinus not being uncovered or the dura exposed, a bone transplant, about one inch in length, with its periosteum, was taken from the patient's tibia, and placed in the operative wound cavity. Not filling it, a number of small bone chips, with and without periosteum, were removed and placed in the cavity, making it level with the cortex. The periosteum and soft parts were then tightly sutured in layers.

At the first dressing there was a profuse discharge from the ear. A few days later a small swelling appeared above the ear; the removal of the upper stitch liberated a small quantity of pus—which continued for three days. Later a probe liberated a little pus from the lower angle of the wound, which continued to discharge for some time. The ear discharged for three weeks. From beginning the wound was simply covered by a light dressing.

At the end of six weeks the mastoid area appeared normal, being perfectly flat, with an almost imperceptible scar. The patient's hearing was normal.

The comment of the nurse who had been present at the dressings of all mastoid wounds for over a year was: "That is the best mastoid that we have had; there have been no painful dressings."

Case 2. Transplantation of Bone Grafts and Bone Chips into Mastoid Cavity at Secondary Operation, following Sterilization of Mastoid Wound Cavity by Carrell Dakin Method.

October 10, 1918. Admitted to hospital.

History: Sore throat, headache and fever, followed by earache and discharge on the following day. The discharge had now continued for several days without pain.

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*Read before the Nineteenth Meeting of the Eastern Section of the American Laryngological, Rhinological and Otological Society, New York City, February 15, 1919.

*Reported at the meeting of the New York Otological Society, Nov. 10, 1918.

October 12, 1918. Very profuse discharge. Slight tenderness over tip of mastoid.

October 23, 1918. Bulging of posterior wall. Conversational voices heard at five inches.

November 4. *Primary Operation*: Simple mastoid operation; at completion a small pinpoint area of granulation seen at bottom of mastoid cavity, which led into a cavity filled with pus, situated in the cancellous tissue within the bony capsule of the posterior surface of the petrous pyramid. In exposure of this infected area, the jugular bulb below, the bony posterior semicircular canal in front, and the dura over the cerebellum behind, were exposed, leaving an unusually deep mastoid cavity. Wound left widely open. Nov. 18, wound 1⅝ inches deep.

Carrell Dakin's Method of wound sterilization instituted. Dec. 4 bacterial count showed surgically sterile wound cavity.

Second Operation: Skin and granulations excised, the latter as far into the bone cavity as possible. One large bone graft and many bone chips placed into cavity—enough to fill it. Tight suturing in layers—periosteum, fascia and skin. Wound covered with light dressing. Slight superficial discharge from lower angle.

Uninterrupted recovery, without suppuration. Upon discharge from hospital: flat mastoid area; almost imperceptible scar; normal hearing.

Comment on Cases: Following the usual mastoid operation, the constant packing of the wound is most disagreeable to the patient, as well as a danger of secondary infection.

The two reported cases demonstrate that with a proper technic, the infection in the mastoid area can, in certain cases, be sufficiently eradicated to allow of the introduction of bone graft and chips, filling the cavity with tight closure of the soft parts, thus reconstructing the mastoid area, eliminating subsequent painful dresssings with the associated danger of secondary infection.

Pathology of Repair in Infection of the Mastoid Cells: The mastoid infection which accompanies chronic, suppurative otitis, when not eradicated by surgical intervention, is controlled by nature by the formation of granulation tissue within the mastoid cells and cavities, which granulation later undergoes an osseous change, resulting in an osteosclerosis, or an "ebonized-mastoid". The process never involves the mastoid antrum however; an antrum always persists no matter how long the infection continues.

An operative-made mastoid cavity heals by granulation, and after a period becomes partially filled with bone again, but the

bony replacement is always of the osteosclerotic type, and is especially prone to reinfection.

As in non-operative cases the ebonizing process never involves the antrum. Even if the antrum is destroyed during the operation, nature makes an effort to reconstruct an antrum by projecting backwards a cavity lined with mucous membrane, thus imitating the production of the antrum pouch or invagination from the middle ear in early foetal life.*

Recurrence of Infection: Recurrence of the infection is a frequent sequelæ of mastoid wounds, because of the liability of the granulation tissue to reinfection (a "recrudescence of a local infection") or a reinfection from the Eustachian tube and middle ear. How often, on reopening a mastoid wound, do we find an enlarged antrum, filled with granulation tissue as yet unorganized?

Secondary Infection: Systematic bacteriological examination of healing mastoid wounds demonstrate that secondary infection of the granulation tissue of mastoid wounds is frequent during the dressings. The streptococcus is the micro-organism which is most frequently grafted on a granulating wound, and once grafted, it is very difficult to eradicate.

While the mastoid wound is still open, a small but definite proportion of cases develop sinus thrombosis, brain abscess and meningitis, and while the usual explanation that the serous complication "had no relation to the operation, and probably was present prior to the operation", may be correct, the fact remains that there existed no clinical manifestations of the graver complications for some time after the operation, but appeared during the after treatment of the mastoid wound. In my opinion, a proportion of these complications is due to secondary infection during the repeated dressings of the mastoid cavity. Anything, then, which will permit a complete closure of the skin is a great gain, as it removes the liability of secondary infection.

Primary closure over a blood clot accomplished this. When first advocated, blood was believed to have a distinct phygocytic action, which, to limited extent, (and probably largely dependent on the kind of tissue into which it is infiltrated) it undoubtedly has. Blood clot *once* infected, is a most favorable media for the growth of bacteria, and as the middle ear remains infected, the immediate infection of the blood clot was so frequent that as a method of treatment of mastoid wounds, it has been largely abandoned.

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*Blake & Reik. Surgical Pathology and Treatment of Disease of the Ear, 1906, P. 34.

Primary and Secondary Closure: During the war it was demonstrated that an infected wound can be converted into an aseptic wound, and then treated as a clean wound, closed and primary union obtained if *(a)* the infection can be eradicated by excision of the infected tissues, or their sterilization; and *(b)* if all dead spaces into which blood may accumulate can be obliterated.

Surgically, then, to follow nature's method of repair, to reconstruct an operatively made mastoid cavity, and to allow of complete closure of the mastoid wound, there must be (1) eradication of the infection by a complete operation with a perfect aseptic technic at the time of operation. (See note.)

(2) The filling in of the cavity of the mastoid so that no extensive vacant spaces will remain for the accumulation of blood, in which the remaining bacteria and those in the neighboring middle ear may propagate.

(3) The erecting of a barrier posterior to the iter tympanui et antri, in order that, while a cavity is left into which the mucous membrane of the middle ear can proliferate, this cavity be a small one—an antrum—thus imitating nature's process of repair.

A bone graft, with enough bone transplants to fill the cavity, introduced either at the time of the original operation, or at a secondary operation after the wound has become bacterially free from tissue disinfection, fulfills the latter two requirements.

Bone transplants (1) can live in a limited infection, (2) the transplants acts as a scaffolding on which bone grows; (3) the transplant is not a foreign body, although the transplant is absorbed, some bone cells remain alive for nearly a year (Berg & Thalheimer)*. (4) A bone defect 4 cm. in length, filled with bone chips, with suturing of the soft parts, will reproduce an apparently normal radius (Bancroft)**.

Note: While absolutely complete eradication of all infection from a mastoid region is impossible, if the operative evisceration is carried well beyond the apparently infected area, the tissue will take care of the slight amount of infection which may remain.

Secondary infection of the mastoid wound during the primary operation is frequent from (a) contamination of the surgeon's and assistant's hands from handling the lobe of the ear, the recesses of which cannot properly be sterilized; and (b) contamination of instruments and sponges by their breaking through the membranous lining of the external auditory canal, which always contains numerous varieties of bacteria.

*Berg and Thalheimer: Regeneration of bone. Annals of Surgery March 18, 1918. P. 331.

**Bancroft, F. W. "The use of Small Bone Transplants in Bridging a Bone Defect." Annals of Surgery, April, 1918, P. 457.

(5) Bone that has been formalized and so surely dead, and then placed in a skull defect, will reproduce a cranial vault (Weed).

As the result of these two cases, I am persuaded that, in properly selected cases, reconstruction of the mastoid cavity either at the primary or a secondary operation, by bone grafts and transplants, with a tight closure, is indicated. Although the result in the second case was so much more satisfactory that I am in doubt if the grafting should not be done at a second operation after the mastoid wound is known to be sterile.

Gallie, W. E. & Robertson, D. E.: "The Transplantation of Bone", Jour. A. M. A., April 20, 1918, P. 11.

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Additional references:

A CASE OF TUBERCULOSIS OF THE SPHENOID SINUSES.

DR. JOHN D. KERNAN, JR., New York City.

Nasal tuberculosis, seemingly originating in the sphenoid sinuses, and largely limited thereto, is of extreme rarity. The following case, therefore, will be of interest:

Mary L., colored, American born, 31 years old, was admitted to Bellevue Hospital June 25, 1918, giving this history: The previous January, six months before, she had been seized by an illness, the chief symptoms of which were prostration, chills and fever. Her family physician diagnosticated it as malaria. She was confined to bed for six weeks. Two weeks after the beginning of the illness she started to have a pain in her head, localized chiefly in the occipital region, but radiating toward each mastoid process. Later it extended even further forward to the orbital regions, affecting especially the right side. She described the pain as having a throbbing, bursting character, occasionally relaxing in

severity, but never leaving her day or night. On the day of her admission the pain became more severe and localized itself in the right ear. This exacerbation brought her to the hospital.

Investigation showed her family history to be irrelevant. She had had mumps and "malaria," the exact nature of the latter attack being difficult to ascertain. She reported herself as having had an occasional cough, not unduly prolonged, and no night sweats. She had lost twenty pounds in six months. Her marital history showed that she had had two children, two miscarriages, several stillborn children.

Physical Examination on Admission: A somewhat emaciated colored woman with pale mucous membranes. Eyes showed an optic neuritis of both, more marked on the right side, with total loss of sight on same side.

Heart: Dullness extended to left beyond nipple line. At the apex was heard a rough, presystolic murmur running into a snapping first sound. Over the pulmonic area, the second sound was markedly accentuated; over the aortic area normal. Pulse normal in rate and rhythm.

Lungs: Signs of pleural thickening over right upper lobe posteriorly. Nothing to indicate an acute tuberculosis.

Examination of nose: A polypoid mass hung in the region of the posterior end of the right middle turbinate. A mucopurulent discharge appeared far back in the nasal cleft of this same side. The septum was straight and the turbinates themselves were of normal size. On transillumination the right antrum appeared dark; all the other sinuses clear.

Examination of pharynx: Large, rough and imbedded tonsils. A rough mass having the appearance of an adenoid in the nasopharynx. Larynx negative.

Examination of ears: Left drum membrane red and bulging.

The following notes were made:

June 26, right maxillary irrigation, return clear.

June 27, left ear drum incised, releasing pus.

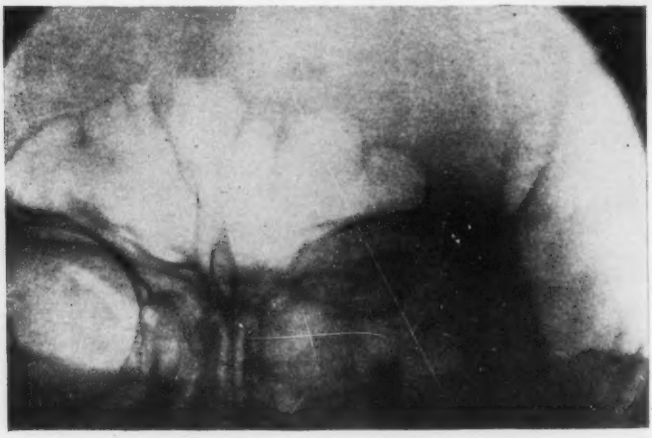
July 9, X-ray of mastoids; slight clouding of left mastoid, with obliteration of septal markings.

X-ray of sinuses: Frontals and maxillary normal. There was a distinct clouding of the right ethmoid region, with dulling of the bony outline about the right sphenoidal fissure. The lateral view shows marked clouding of the sphenoidal sinuses.

Aug. 1. Since admission the patient's temperature has run from normal to 101°. The otitis of the left side has cleared up. The

patient still complains of severe pain. Wassermann blood reaction negative. Today the posterior end of the middle turbinate on the right side was resected and the anterior wall of the right sphenoid sinus was removed. The sinus was found to be full of an extremely friable tissue resembling granulation tissue. Considerable amount of this was removed. On section this tissue was pronounced to be tuberculous.

Aug. 20. A Denker operation was performed on the right side, the anterior and inner walls of the right antrum being removed. The antrum appeared to be healthy except posteriorly, where the



Both frontal sinuses are clear. On the right side, as contrasted to the left, the outline of the sphenoid fissure has completely disappeared. In addition to this the septa between the ethmoid cells are indistinct. Those found involved at the time of operation were the posterior group.

mucous membrane was thick and edematous. The right middle turbinate was removed and the posterior ethmoid cells were found to be full of pathological material, their bony walls being necrotic. The floor and anterior wall of both sphenoidal sinuses were found to be in a similarly diseased condition, and on their removal the sinuses themselves were seen to be filled with a granulomatous mass. The destructive inflammation likewise involved the dorsal one-third of the vomer, and the pterygoid processes and perpendicular portion of the palate bone on the right side. All this diseased material was removed to the extent possible. The mass hanging from the roof of the naso-pharynx, which had the ap-

pearance of an adenoid, likewise proved to be made up of tuberculous tissue. This was removed with an adenotome and curettes.

The patient's reaction to the operation was exceedingly favorable. She was free from pain the next day, and has continued so up to date (Sept. 6, 1918). The wound in the mouth healed promptly. Ten days after the operation on her sinuses the diseased tonsils were removed. From this operation she also recovered quickly.

Examination of the nose and naso-pharynx at the time of her leaving the hospital showed the operative areas to be clean, though there was still a small amount of purulent discharge.

Although disease of the nasal sinuses has been found in a considerable number of tuberculous subjects at autopsy, it has been demonstrated to be of tuberculous nature in comparatively few cases. Dorner, writing in 1913, reported that he had found but thirty cases in the literature. The majority of these cases were in the antra. A few have had their origin in the frontal sinuses, and still fewer in the ethmoids. A case having its beginning in the sphenoid sinuses, as seemingly has this present case, has not, as far as I am aware, before been reported.

The symptoms, in addition to the constitutional symptoms of tuberculosis, which, where the disease is limited to the sinuses and not active elsewhere, may be slight, are those of a chronic sinusitis with discharge and pain more or less depending on the freedom of drainage.

The treatment in addition to the constitutional treatment, with the use of tuberculin, should be surgical. If the disease can be eradicated the prognosis is good. In extensive cases such as this present one total removal is almost impossible, and although the result in this case has been so far favorable, a return of the disease can be expected.

My thanks are due Dr. C. G. Coakley, head of the throat service at the Bellevue Hospital, by whose favor this case is reported.

Those wishing to investigate this subject further will find the papers of Dorner, Freer and Gleitsman of the greatest assistance.

156 East Seventy-ninth Street.

TECHNIC OF TONSILLECTOMY WITH THE LA FORCE HEMOSTAT TONSILLECTOMES, MODELS A AND B.

Dr. B. D. LaForce, Ottumwa, Iowa.

The tonsillectomes, models A and B, are provided with a mechanism whereby the principle of applying a hemostat to the tissues before they are severed to lessen the danger of hemorrhage may be readily applied to the enucleation of the faucial tonsil.

When the hemostat of the tonsillectome is properly applied to the tissues in operation for enucleation of the tonsil all of the tissues immediately back of the tonsil are securely held and crushed. The hemostat may be retained in this position, holding and crushing the tissues even after the knife blade of the instrument has been made to sever the tonsil from its bed in the sinus tonsillaris.

Enucleation of the tonsil is best performed by this method under ether anaesthesia. A mouth gag should be used which obstructs but one side of the patient's mouth and should be adjusted to the same side on which the tonsil is being operated. In this way the opposite side of the mouth is left free for the better manipulation of the instrument.

The patient should lie with the back of his head resting and securely held on the table. Before the instrument is inserted into the patient's mouth it should be examined to see that it has been properly adjusted for operation. It is very important to see that the cutting edge of the knife blade has been retracted one or two mm. from the crushing end of the hemostat blade.

With the instrument held in the right hand if the right tonsil is being operated, the distal end of the instrument is inserted between the tonsil and the posterior pillar, with the hemostat blade directed towards the tonsil. The shaft of the instrument should lie, or be pressed against the opposite and unobstructed angle of the mouth. The instrument in this position does not prevent a clear view of the parts operated upon, and it is necessary to have it in this position to properly engage the tonsil in the hemostat.

To successfully engage the tonsil in and through the fenestra of the instrument it should be manipulated as if the angle of the mouth in which the shaft of the instrument is lying were being used as a fulcrum to pry or lift, or dip the tonsil out of its bed

in the sinus tonsillaris and into the fenestra. This kind of manipulation should be continued slowly and with not too much force until the pressure causes the tonsil to bulge the anterior pillar forward. When this stage of the operation is reached three important manipulations are next performed practically at the same time. They have for their object the passing of the tonsil through the fenestra and getting the hemostat fastened to the tissues back of the tonsil.

First. The bulging anterior pillar is gently but firmly pressed upon with the end of the first finger of the left hand, if the right tonsil is being operated, the pressure being continued to press the tonsil through the fenestra while the hemostat blade is forced back of the tonsil.

Second. The handle of the instrument is raised to a less horizontal position, causing the shaft of the instrument to take a position near the middle of the mouth, but the end of the instrument back of the tonsil should be disturbed as little as possible.

Third. The handle of the instrument is pressed together, forcing the hemostat blade back of the tonsil if model A is being used; if model B instrument is being used, the hemostat blade is forced back of the tonsil by pressure being applied to the handle end of the blade. This pressure is more easily applied if the instrument is first grasped so that the thumb hugs around the handle end of the hemostat blade, releasing the handle with the thumb and placing the palmer surface of the hand over the handle end of the hemostat blade when it is necessary to make the pressure.

The tonsil should now have slipped through the fenestra and the hemostat should have the tissues immediately back of the tonsil in its grasp.

After the tissues have been properly engaged in the hemostat the hemostat should be locked and the tissues thoroughly crushed. To perform this, a very important part of the operation, the wheel controlling the hemostat blade should be turned to the left and made to tightly impinge against the frame of the instrument. It must be understood that this is the procedure that tightens the hemostat, and should be carefully and thoroughly performed.

After the hemostat has been securely locked and the tissues are being held and crushed, the tonsil should be removed. The tonsil is held with any suitable forceps and the wheel which controls the knife blade is turned to the right as far as it will go, which severs the tonsil from the tissues held in the hemostat.

The hemostat may be left holding and crushing the tissues for five to fifteen minutes or longer, as is thought best in the individual case.

To release the hemostat turn the wheel which controls the hemostat blade to the right.

No claim is made of originality in that part of the technic of forcing the tonsil through the fenestra of the instrument.

Tardy Hemorrhage After Removal of Hemorrhoids. H. SEGUI, *Rev. de Med. y Cir.*, Havana, January 25, 1919.

Segui emphasizes the need of rest after adenoid operations by the following case: A boy of 12 was subjected to removal of adenoids and the mother was told to take him home and keep him perfectly quiet. Instead, she took him shopping and three hours after the operation an alarming hemorrhage came on which induced syncope. It was necessary to pack the naso-pharynx. The boy was not a hemophiliac. The author also refers to a similar tardy hemorrhage in an adult after removal of relics of adenoids.

A SIMPLE, SAFE AND RAPID TONSIL ENUCLEATION TECHNIC FOR LOCAL OR GENERAL ANAESTHESIA.

Dr. Lawrence Gatewood, New York City.

LOCAL ANAESTHESIA.

When done under local anaesthesia this is induced by the following method:

A solution of ½% procaine (novocaine), 4 drachms of 16 cc containing five minims or 0.3 cc of adrenalin 1/1000 or epinine 1/1000 is prepared. This should suffice for both tonsils. Through a single puncture located on a line tangent to the crown of the last lower molar and 1 cm. behind it the entire anaesthesia is produced. The needle is introduced, directed backward and slightly outward, with the bevel facing outward so as to produce an early bleb and later to deposit the solution in the peritonsillar tissue. The bleb should be large, covering the entire anterior surface of the anterior pillar. The needle is advanced, as mentioned, infiltrating its course a distance governed by the antero-posterior dimension of the tonsil. The needle is guided by the fascial plane between the capsule of the tonsil and the superior constrictor muscle. Deviation from the correct course may be determined by rotation of the tonsil on its vertical axis when the needle impinges upon the capsule. The infiltration is continued without withdrawing the needle until the posterior pillar has been reached and infiltrated. The procedure is then performed on the opposite side. Usually the left tonsil is first anaesthetized. The patient is then permitted to rest in the recumbent posture for ten minutes. With this method of injection the anaesthesia is complete, the patient experiences no discomfort; he perceives only the pressure of application of the forceps.

Certain types of patients bear adrenalin poorly and require a stronger solution of procain 1%. These are the hyperthyroid cases or those with endocrine disturbances manifested by thick, dark and heavy hair. These patients are best fortified with a preliminary dose of morphine.

THE OPERATION.

Through the loop of the snare the tonsil is grasped with an 8 inch long curved mouse tooth scissor handled forceps, whose blades are about 1½ inches long. As much of the tonsil as can be grasped is included in the bite. The upper blade is fixed first by firm

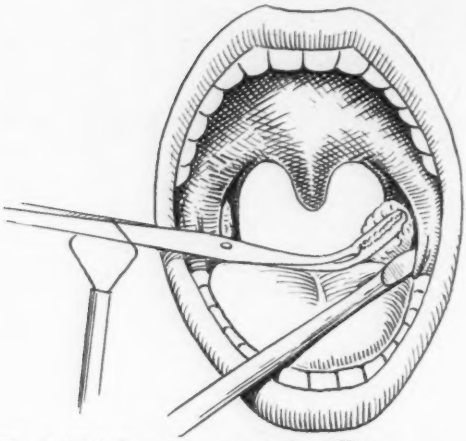


Fig. 1—Bleb formation on anterior pillar.

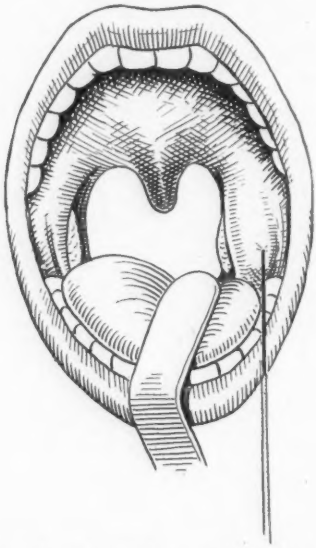


Fig. 2—Insertion of dissector under anterior pillar at point where tonsil is loosely attached.

pressure into the capsule, just below the superior angle of the converging pillars, and the lower jaw of the forceps is then pressed to the same depth, seizing the inferior reflexion of the capsule. The handles are then locked, sufficient pressure being used to pre-

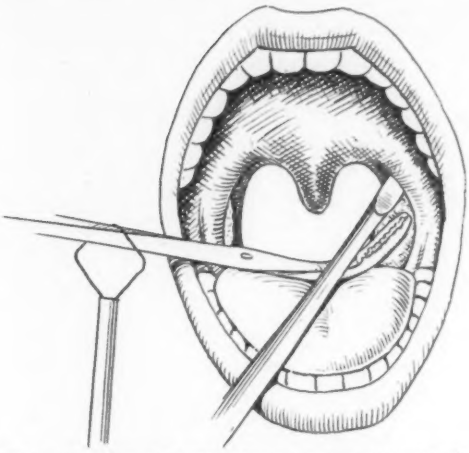


Fig. 3—Position of instrument at end of its excursion in lifting anterior pillar away from tonsil.

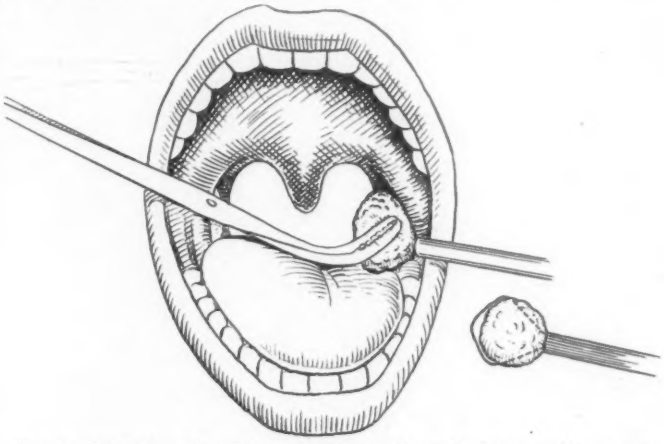


Fig. 4—Anterior pillar detached and tonsil ready for complete separation by means of snare.

vent dislodgment of the blades. If this maneuver is properly performed the capsule will be included in the bite. This is the most difficult step in the operation and its correct performance is essential to the smooth and rapid completion of the enucleation. When the tonsil is buried the blades are introduced in apposition between the pillars and are then separated so as to release the tonsil and the procedure above described is carried out.

The left tonsil is grasped with the forceps in the left hand, the right with the forceps in the right hand. The forceps are then drawn inward and rotated so that the convexity is inferior and serves for the tongue depressor, which is now discarded. A curved tonsil elevator is employed to lift the anterior pillar from the tonsil.

The elevator is introduced with the concavity facing the operator at the upper loose attachment of the pillar by gentle pressure. The mucous surface of the anterior pillar is undisturbed because the tonsil is dislodged from behind the anterior pillar by sliding the anterior pillar and its covering membrane away from the tonsil. The anterior margin of the capsule is now brought into view.

The operation should be quickly completed at this point with a snare shaped to cut from before backward. This is accomplished

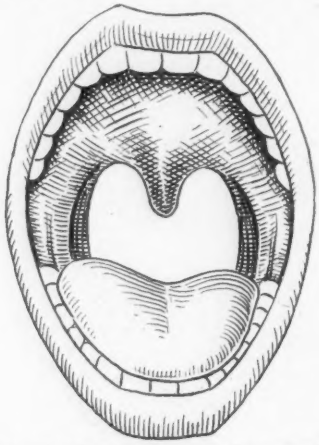


Fig. 5—Appearance of pillars after complete enucleation.

by employing a heavy No. 10 piano wire in an ordinary snare handle bent into a semi-diamond shape.

In entering the snare cannula traction will force the proximal sides of the wire into apposition, separating the tissue between, and then the lateral points of the diamond will have to approach, thus projecting the central portion or the free blunt point of the diamond backward, which becomes fixed at the attachment of the capsule to the posterior pillar, and the mucous membrane is unimpaired because there is no traction on the mucous membrane of the posterior pillar during the dissection of the tonsil with the snare thus arranged. There is no purse string action of the snare which usually tears the membrane away or removes some of the posterior

pillar. Just prior to bringing the stilet of the snare home the handle of the instrument is carried outward, which position favors easier completion of this manipulation. Occasionally considerable force is required in doing this, depending upon the fibrous condition of the tissues. The snare wire arranged this way gives all the advantages of the Sluder instrument, cutting from before backward, besides allowing greater flexibility, thus permitting its insinuation behind the tonsil. Another advantage of this snare is that the connective tissue is bruised and pulled backward over the retracting vessels as they are divided. Occasionally a section of the venule

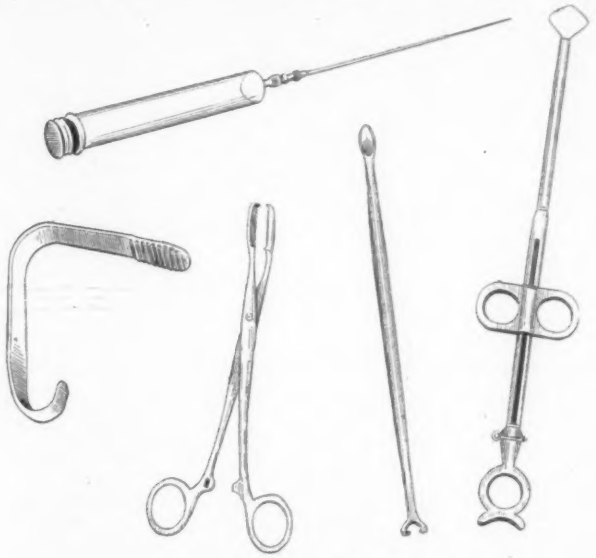


Fig. 6—Instrumentarium.

lying on the capsule is removed. This causes free bleeding, which speedily stops by coagulation in two to five minutes.

It may be remarked parenthetically that thrombophlebitis in this venule is a step in the development of tonsillar sepsis and its prevention an indication for tonsil enucleation. It is important to caution the patient against hawking, which may displace the clots by suction and cause secondary hemorrhage. Should this occur the patient is instructed to lean forward and breathe through the wide open mouth. The hemorrhage will then quickly stop.

The operation should not require a longer time for its performance than one minute per side. The bleeding, if any, from the

side first operated, usually the left, should have ceased before attacking its fellow. The blood loss in the majority of cases is less than eight cubic centimetres.

OPERATION UNDER GENERAL ANAESTHESIA.

When general anesthesia is employed, as for young children, the same technic of enucleation is used. The patient's head is turned to the right and the inferior or right tonsil removed and the fossa filled with a sponge; the left or superior tonsil is then approached. The maneuvers are performed so rapidly that the sponge is not completely saturated when the second tonsil is delivered and its fossa filled with a sponge. Profound anaesthesia is unnecessary and I have frequently performed the operation in an ether rausch.

15 East Forty-eighth Street.

ing area, which showed some tension against the anterior surface of the pillar. Upon palpation the hard, embedded body could be seen to be the styloid process.

The tonsils were removed at the Delaware Hospital November 2 and then this process was dissected out of the posterior tissue of the pillar for three-quarters of an inch and broken off. On November 12 and since then the patient has had no uncomfortable

REPORT OF STYLOID PROCESSES APPEARING IN THE THROAT WITH SYMPTOMS.*

DR. W. O. LAMOTTE, Wilmington, Del.

Mrs. B., age 28 years, was referred by Dr. Rumford, October 30, 1918, for the purpose of finding out whether the tonsils had anything to do with some general symptoms. The patient said that since spring the left side of the throat felt like she was cutting a tooth. In August she had an attack of acute tonsilitis, and since then had felt languid and suffered with suboccipital headache almost daily and had had some enlargement of the left cervical glands. This indisposition was new to her, because previously she had nearly always been strong and rugged, riding bronchos and canoeing a great part of her time. She had had, however, previous attacks of tonsilitis, but never so severe, and when 15 years of age had an attack of acute inflammatory rheumatism.

Examination showed embedded and diseased tonsils. Along the margin of the left anterior faucial pillar, beginning at about its center and extending up and back a short distance, was a glisten-
sensations in her throat, no headaches, no enlargement of lymph glands and has felt as well as ever.

*Read before the Philadelphia Laryngological Society, April 2, 1919.

In THE LARYNGOSCOPE of November, 1915,* there appeared a report of a styloid process appearing in the throat, which was referred to me in April of that year. This was in a man 51 years of age, was on the left side, but in the lower part of the tonsil, and showed no evidence of being there except to palpation. This man complained of a dry cough and sensation of something sharp in the left side of the throat for eight years and stated that he had been treated by twenty-nine doctors without any benefit. He had very little tonsilar tissue and nothing more than a slight catarrhal condition could be seen. It was only by palpation that the styloid process was discovered. Under cocaine this process was dissected out for about one inch and one inch of it was removed. The symptoms, except some cough, immediately disappeared.

Dr. W. S. Syme reported in the *Journal of Laryngology, Rhinology and Otology*, August, 1915, an "Abnormally Long Styloid Process Causing Throat Symptoms." This case was a physician 43 years old, who complained of a sensation of dragging in the left side of the throat, worse on swallowing, and present since an attack of tonsilitis three years previous. Symptoms disappeared after removal.

Dr. Geo. J. Alexander reported in the *Journal of Ophthalmology, Otology and Laryngology*, May, 1917, "A Very Long Styloid Process With Throat Symptoms," in a woman 50 years of age. Her symptoms began after a fall six years previous in which she struck the back of her head. She complained of a painful condition of the right tonsil and a feeling as if there were something that must be swallowed. These symptoms disappeared after removal of the end of the bone.

Dr. Sam Key reported in THE LARYNGOSCOPE of November, 1918, "An Elongated Styloid Process" in a man 24 years old, who complained of attacks of tonsilitis and quinsy, and since a tonsil operation eight months previous a development of a drawing sensation in the left side of the throat. Dr. Key removed the tonsils, but did not deem it necessary to remove any of the styloid process. After he had freed the process, following the tonsillectomy from the scar tissue, the symptoms disappeared.

These cases are of importance because the patients were correct when they felt there was something in their throats that should not be there, and because some obstruction might be met with when it comes to cutting off the tonsil.

Ford Building.

*Editor's Note.—Cases of styloid process in the tonsils were reported by Dr. A. W. Stirling of Atlanta, Ga., in 1896, before the Laryngological Section of the American Medical Association and published in the transactions of the Association under the title of "Bony Growths Involving the Tonsils."—P. F.

A MODIFICATION OF THE BECK-SLUDER TONSILLECTOME.

Dr. E. Lee Myers, St. Louis, Mo.

In utilizing the Sluder technique for the removal of tonsils, various modifications have been made of the original Sluder instrument. It has been a question of the personal equation as it appears from the various models made by the instrument makers.

Personally, I believe that the Beck-Sluder instrument as modified by Schenck and Voislawski represents an ideal instrument if one does not fancy the guillotine, with this disadvantage however, that it is difficult to obtain the leverage that one has with the Sluder guillotine because of the lack of leverage when one works from the end of the instrument.

With that idea in view I have had a Sluder grip attached to the Beck-Sluder instrument at the same angle that the Sluder handle attaches to the guillotine, which permits of apparently the same strength of leverage as the original Sluder instrument.

The handle is screwed to the plate of the ratchet arrangement in such a manner that it can be easily detached when one desires to use the instrument for tonsil dissection, or prefers to use the instrument as outlined by Dr. Beck of Chicago.

Technique: Sluder's technique is not varied from in the least except that it is necessary to make use of the trigger and ring attachment to obtain a firm hold on the tonsil and the final extirpation is done by the ecraseur which is negotiated by the ring at the proximal end of the instrument.

In my hands the following technique has thus far proven itself of advantage: The instrument is handled as one would a revolver in a horizontal position, approaching the tonsil from the opposite side of the mouth, using the Vedder tip to depress the tongue, At this point the lowermost portion of the ring pulls in the inferior pole of the tonsil; this is done by rotating the instrument from a horizontal position to a vertical position with the Sluder handle now pointing to the opposite side. The superior pole of the tonsil is now threaded into the loop.

By feeling along the anterior pillar one determines whether the tonsil is entirely through by the thinness of pillar. Then the tonsil can be brought forward against the prominence of the eminentia

alveolaris. At this point, the free hand pushes the trigger forward, thereby loosening the ratchet arrangement, the two rings are now brought towards the operator to hold the tonsil in the snare and the trigger is now brought into the locking position. The ecraseur can be applied quickly or slowly as the operator wishes.

For the removal of the left tonsil, I find that one must approach a fair degree of ambidexterity, the trigger, which points upward in this case, is loosened with the free hand; the rings on the handle are drawn backward to engage a firm hold on the tonsil, the trigger is now locked by being drawn backward, and the ecraseur may now be used.

Advantages for the instrument are:

(1) It has the original advantage as brought out by Sluder in using the eminentia alveolaris as the fulcrum for the bringing of the tonsil forward because of one's ability to obtain a good and sufficient leverage.

(2) As the Vedder tips are easily detachable, one instrument will suffice for the various sized tonsils.

(3) The Sluder handle being easily detached, one may use the instrument for tonsil dissection, or for the original Beck-Sluder technique.

(4) Personally, I believe that a snare gives less haemorrhage in the removal of tonsils and thereby reduces the liability by the slowness with which one can crush the engaged tissues.

207-8 Wall Building.

TWO UNUSUAL CASES OF FOREIGN BODY LODGED IN THE UPPER RESPIRATORY TRACT.

DR. JNO. F. CULP, Harrisburg, Pa.

In presenting these two unusual cases of foreign bodies, lodged in the upper part of the respiratory tract, the writer hopes to evoke such discussion of the subject as will be helpful to us as oto-laryngologists in making a diagnosis of these otherwise obscure conditions.

Case 1. An elderly lady, 62 years of age, consulted me in September, 1914, complaining of a pricking sensation in the throat and difficulty in swallowing, with a marked sensation as though something, to use her expression, was "sticking in the throat." She complained of these symptoms for three or four days after eating some pineapple, and she supposed that some part of the pineapple covering had lodged in her throat. A careful examination with the laryngoscopic mirror failed to show any evidence of a foreign body. She, however, was very persistent in saying that something was lodged in her throat, and after a thorough application of cocaine and a removal of all mucus from the various cavities, a black line, about one-eighth of an inch long, was seen at the bottom of the sublingual sinus, near its attachment to the epiglottis. This line was at right angles to the tongue, and when grasped by a pair of forceps proved to be a metallic substance. Efforts to dislodge it were unsuccessful for some time, until finally it was found that it could be moved to the right, but not to the left. After quite some manipulation the foreign body was removed, and proved to be a sewing needle of medium size, a large part of the head of which was missing. This needle, while discolored, showed no sign of rust, except for one part, about the center, which probably corresponded to the portion which was first seen when the throat was examined. The subsequent history of the patient was uneventful, all the symptoms disappeared, and there was no special reaction following the removal of this foreign body. The patient, as well as myself, was very much surprised, and on seeing it she immediately made the remark to her daughter, "That is the needle that stuck in my left knee eleven years ago while I was on my knees scrubbing up the floor." At the time, in endeavoring to extract the needle, she broke off the greater portion of the head, and the rest of the needle disappeared in the tissues in the inner side of the left knee. She never experienced any special trouble from this cause, and the incident had been forgotten.

About three weeks prior, however, to the time that she consulted me, she had a distinct pain and soreness, with some swelling in the posterior border of the left sterno-mastoid muscle. These symptoms were sufficient to cause her to consult her physician, who diagnosed muscular rheumatism, and prescribed for this condition. After the soreness had persisted for about a week, it gradually disappeared.

In my opinion, it is very likely that these symptoms were due to the presence of this migratory needle, which lodged itself in the tissues at the base of the epiglottis.

(It has not been the writer's privilege to have access to a large medical library, and such works as he has been able to consult have not been of much value in recording similar cases of migratory foreign bodies lodging in the throat.)

There are, of course, many instances, both in the lay and medical press, of foreign bodies migrating from the point of penetration to far distant organs and tissues. These foreign bodies are, however, almost invariably smooth, pointed metallic substances, such as pins, needles, nails, etc. Occasionally a sharp piece of bone will move from the point of penetration of an interior organ and be found in adjacent tissues. Because of the softening action of the tissue juices, however, such organic substances do not usually have a long stay in the body.

On one occasion I saw a nail which had lodged in the heart of a cow which had been killed, and which very likely had been swallowed by this animal and ultimately found its way into this organ.

Case 2. A little girl, aged 3 years, was brought to the Harrisburg Hospital in May, 1914, with a vague history of having inspired some foreign substance. This child, the daughter of a farmer, and unusually robust, was playing in the kitchen on Thursday evening, when she suddenly was seized with a fit of choking, and was almost suffocated. The parents said that she was eating some bologna sausage at the time, and it was supposed that this sausage, probably the skin, was responsible for the suffocation. When seen by the family physician, a couple of hours later, the child was breathing very well, and apparently there was no special cause for any anxiety. Within twenty-four hours, however, the breathing again became labored, and there was a distinct rattling in the chest. She was then taken to a consultant in the neighboring city, who advised that she be placed under my care. She was admitted to the hospital late the following Sunday evening, and I was unable to see her until the next day, Monday, about 12:30. I found the child very cyanotic,

pulse very rapid, and uncountable, extremities cold, and breathing most labored; in fact, the child presented every evidence of impending death. A low tracheotomy was immediately performed, and after separation of the edges of the trachea a substance was seen moving rapidly to and fro, with a vast quantity of mucous. With considerable difficulty this substance was caught, and proved to be a grain of corn, which was swollen to about three times its normal size. The child was placed on its face, with the head far over the table, and an enormous quantity of mucus came out of the tracheal wound. The subsequent history was comparatively uneventful. The temperature, which had been 104 6/10 previous to the operation, immediately began to subside, and at the end of the fourth day it was normal. Examination of the lungs after the operation gave distinct signs of a widely scattered capillary bronchitis. The tracheal wound completely healed in three weeks, and at the time of the child's discharge from the hospital, less than a month after its admission, the voice had been completely restored.

The surprising feature in this case is not so much in finding a foreign body, but in finding one the character of which was never suspected. It is very likely that this little child had a grain of corn in its mouth at the time it was eating the bologna sausage, and that this was the thing that was inspired, causing the suffocation. The corn being an organic substance, it rapidly absorbed moisture and increased enormously in size. Such round, organic substances as peas, beans, grains of corn, peanuts, orange seeds and the like rapidly absorb moisture, and not being very heavy, are not likely to lodge in some part of the bronchial tree, and consequently are rapidly churned to and fro by the respiratory movements.

The writer recalls two similar cases occurring in his practice many years ago, and is now convinced that the death of these children was caused by inspiration of organic substances, and the later development of pneumonia.

It is a matter of great importance when we are called in to see patients in which there is even the remotest history of inspiration of a foreign body, that we absolutely convince ourselves of its non-existence before we complete our diagnosis. Unfortunately, in case of organic substances, the X-ray is of little or no avail, as the substances themselves are too soft to produce a shadow. Chevalier Jackson and other oto-laryngologists, who are doing considerable bronchoscopic work, are of the one opinion that organic substances lodged in the upper respiratory tract are not only much more difficult to extract, but almost invariably produce an infective bronchitis or pneumonia.

MODERN COMMENTARIES ON HIPPOCRATES*. THE PHYSIOLOGY AND PATHOLOGY OF THE NOSE AND THROAT.

DR. JONATHAN WRIGHT, New York.

A number of years ago I contributed a series of papers to the pages of this journal which finally grew into a History of Laryngology. I fear the work was more full of pleasure to the writer than to the readers of THE LARYNGOSCOPE, but the glimpse I then got of the beliefs of medical men of remote ages, and especially of civilizations foreign to our own, abided with me as an alluring motive during many years devoted to other interests more directly associated with the daily practice of laryngologists. When the time and the opportunity came for me to enter more fully into that long-buried world of Egyptian and Babylonian and Indian and Persian medicine, and to see how in the Papyros Ebers and in the Poem of Gilgamesh, the Rig Veda and the Zend Avesta, medical theory and practice shaped themselves, the old interest again became a pressing one.

The endeavor to ascertain or even to get a glimmer of a reason how men, quite as well, perhaps better, equipped with the cortical grey matter of the brain than we are, came to believe things that to us seem utterly devoid of foundation for any rational belief, was a baffling one, but the stimulation to effort, in the intensity of its effect, often partakes of the nature of the ardor to solve a puzzle with which the latest craze fills the shops and occupies the street corners. Much light is thrown on the problem by studying the ethnographic literature of modern primitive races, but perhaps even more interest is aroused in the mind in the attempt to trace the thread of thought from those ancient prehellenic civilizations to that wonderful phenomenon of mental activity exhibited by the literature and what is left to us of the art of Greece in her glory. Where did it come from? How did it happen? We ask when we read the Greek tragedies, the dialogues of Plato and quite as insistently when we study the books of the Hippocratic collection. Of course, this is not the place to go into that question, but I thought perhaps those readers of THE LARYNGOSCOPE who may have any recollection of the work on the

*The translations of Francis Adams' "Hippocrates, Genuine Works," v. 1, New York: William Wood & Co., and E. Littré's "Hippocrates," Oeuvres complètes, Paris: J.-B. Baillière, 1839-1861, 10 v., have been chiefly used and compared with Littré's Greek text.

History of Laryngology, which the editor so generously gave to the world almost two decades ago, might have some curiosity to know why I am returning to such a remote and unfrequented corner of laryngology as has to be invaded to find what sort of an idea Hippocrates and his associates had of the diseases of the nose and throat.

It is impossible, in what immediately follows, for me to avoid allusion to ground already traversed in that earlier attempt of mine, but I shall attempt to give it a different coloring and greater expansion. First, one must be warned explanations do not arise in the human mind from the observation of facts or supposed facts solely as the results of direct observation. They arise as the result of the synthesis or the reconcilement of new phenomena with something which has preceded. However hidden, however earnestly it is disclaimed, there is always, even in the most austere of modern researchers, a theory which guides the way not alone to the interpretation of phenomena, but to the actual observation of facts as well as to hallucinations. The human mind will not work in any other way. Of course, we turn the corner to our office or pick up the morning paper without any theory building and expend a vast amount of energy directed by lower nerve levels and even of what passes for thinking without any theory building, but that is automatism. When Pasteur set out to find enantiomorphous crystals or Koch to find the tubercle bacillus, it would have been quite useless for them to deny or their historiographers to pretend that they had no theory. We know better. It is true that discovery of facts more often than not results incidentally from activities directed by theory to different ends than those arrived at, but the reason the fact is recognized is the receptive corner prepared almost insensibly in the observer's brain for it and into which it almost seems to fall automatically. Call it a working hypothesis or what you will, that receptive corner must exist or else the fact will not fall into it.

A fact, I define as something that is usually not eternal truth, about which I for one know nothing nor ever expect to, but as something which I believe in because it makes a link between two otherwise separated phenomena as they are apprehended in my mind. It may not be the right link at all—in the actual history of thought it usually is not or at least does not appear to us in a different era, a different environment, to be so. The truth or the falsity of the fact or theory has nothing to do with it, or at least they must have nothing to do with the problem if we are to follow out the chain of reasoning which appeals to Hippocrates and his fellows or to any other coterie of thinking

beings in any other age of the world or in any other corner of the globe. I am not even concerned whether my definition of fact and theory is correct or not, if it helps me to make others understand something of the interest playing with the puzzles presented by the history of thought has for the student, the dry-as-dust bookworm. My attitude is an entirely pragmatic one and others, if they wish, may go off on this scent into psychological and logical paths to prove me wrong. I wish to know why Hippocrates and his fellows, possessed, as many assert, of a better brain than we, thought some of the drink and even of the food when swallowed goes down the windpipe into the lungs?

I. PHYSIOLOGY.

This "fact" is set forth in the way best suited for my purpose here in the book *"On the Heart"* (§ 1, 2). It perhaps may be impossible, at Littré seems to think, to attribute the authorship of this book to Hippocrates himself with any degree of certainty, but that in no way deprives it of interest for us. The chief thing we want to know is how anyone came to believe such a thing as is there set forth. Let us turn to the book itself and see. It was by research—by the experimental method—most approved of modern ways. I know I have alluded to this passage in my former work, but I wish to approach it again at an angle which has become accentuated by the years of experience in laboratory work and in contact with those engaged more successfully in research than I which have intervened since the opening years of this century. The passage reads, "Here is the proof of the fact. Stain water with blue or with red lead, give it, much diluted, to drink to some animal, especially a pig (this is a beast neither particular nor nice), then cut his throat while he is drinking; you will find it colored by the drink, but this operation does not succeed in everyones' hands."

We are not confined to the record of the experimental method for evidence of this fact, for we also find it stated in the first or preceding paragraph that in the pericardium "there is just enough liquid to prevent the fire (internal heat?) from burning the heart. This liquid is a serosity filtered out by the heart which drinks, receives and consumes the liquid which comes from the lungs." This is evidence by direct observation from post mortem findings.

No one pretends that even modern pathological observers or researchers are devoid of liability to error, but this passage indicates that there was no mistaken *method* adopted to prove this fact. It is not difficult to imagine that this resort to a modern popular way of proving it, in an age when the experimental method was not

so popular, was due to a difference of opinion. The evidence for this is not far to seek. I have formerly pointed out proof of the wide prevalence of the opinion maintained here, and to be noted also in Euripides as wel las elswhere, which persisted for fully 2,000 years in medical belief. Yet even in the time of Hippocrates we find protest against it coming from a Cnidian author if we are to agree with Littré in the idea that the Fourth Book of Diseases came from that school. "Some say that the drink goes into the lungs and from thence to the rest of the body. Those who support this opinion are deceived by what I am going to mention, namely, that the lungs are porous and that a tube is connected to them. But if the lungs were not porous and provided with a tube, animals would have no voice. We emit sounds by the aid of the lungs—because they are hollow and have a tube connected with them; the sound is articulated by the lips and the tongue . . . If the drink passed into the lungs, I assert that the lungs being filled, one could neither speak nor breathe easily." Then he goes on to advance more reasonings which, while scarcely less plausible, do not perhaps so readily appeal to us.

Now, from this point of view which we occupy at present in anatomy we perceive that deductive reasoning—pure deduction—was ample to demolish evidence furnished by the experimental method and by direct observation.

On the authority of Plutarch (Symposiacs VII., 1), as I have pointed out, Nicias, a physician of Nicopolis, ascribed this opinion of the lungs taking in fluid to Alcaeus, a poet who died 120 years before Hippocrates was born, and we shall find traces of it in Homer and in Plato's Timaeus the greatest mind of antiquity gave it credence. Surely there must be some exceedingly formidable reason why this idea was so widespread and persisted so long and yet is one which outrages our own knowledge of anatomy, and at which Cnidian authors, full of many worse oriental superstitions, revolted in the time of Hippocrates. I claim that this furnishes a matter of interest for people who sneer at the dry-as-dust bookworm. It involves the marvels of the workings of human belief, the faults of the most lauded methods of science with which modern experience is familiar.

In the first place we have every reason to believe* from the ancient texts of the Epic Cycle and from those much later than Homer that larynx and pharynx were originally not differentiated, nor does it always seem clear in the Hippocratic texts, as we

*Cyclops I., 157.
*See Diseases, IV., § 56.
*Wright, J., History of Laryngology, 2d ed., p. 38.

have a right to infer from passages already quoted, but the supposed Cnidian author points out clearly that the way into the stomach through the pharynx is always open and the canal to the lungs is surmounted by the epiglottis, so that in deglutition nothing can pass to the lungs. Yet Plato and many a wise man after him went on saying water, at least, goes into the air vesicles. This time something contradicts direct observation, and it is something very like direct demonstration, but the result is the same as that from rational demonstration. Plato, and Plutarch's friends four or five hundred years after him continued the argument—said the lung has "within hollows like the pores of a sponge in order that receiving the breath and the drink and cooling them it might . . . alleviate the heat."

In an article which I called by the title of "The Blight of Theory on the Acquisition of Anatomical Knowledge by the Ancient Egyptians," I tried to show that it was probably largely due to the prevalence of a primitive form of the pneumatic theory that the remarkable anatomy found in a very ancient part of the Papyros Ebers was imagined and set forth with very little appeal to fact by a people whose priests spent a thousand years and more in embalming dead bodies. I might have given a similar title to this essay. Let us go at once to the Hippocratic text, to the book *"On the Heart"* and observe also there, in one of the passages already quoted, that the pericardial fluid is to cool the fire of the heart. It would have to be constantly renewed to do this, and whence would the fresh supply come except from the lungs, which have a pipe to them from the outside?

In another one of the Hippocratic books, "The Nature of Man," the author, supposedly the one who also wrote the treatise *"On Ancient Medicine,"* or one intimately acquainted with its doctrines, declares that man is not made of any one element, fire, earth, water, air, but of a single substance, including all these, alluding to the system of Melissus, who held some such doctrine as now prevails in physical science as to the unity of all forms of matter and perhaps of matter and force. Various influences we are left to infer keep the component parts in the proper proportion, in accord with the doctrine of Alcmaeon as to health representing an equilibrium, which is also a fundamental modern idea. Now some philosophers, following Diogenes Apollonius, ascribed everything to air, and Heraclitus, with all his profundity and obscurity of thought, nevertheless upheld the idea of fire (heat). One of the Hippocratic authors, he who wrote the book *"On the Diet,"* declares "fire, the warmest and the strongest,

New York Medical Journal, Dec. 7, 1918.

which overcomes all things, governing everything according to nature." This also was a view of great antiquity.

We need not dwell further on this aspect of the doctrines of the constitution of the body. We know Anaximander laid emphasis on the water, while Empedocles, all of these of a date antecedent to the life of Hippocrates, though that of Empedocles overlapped it somewhat, declared the body was made up of all four elements, earth, water, air and fire. It was the respired air, the thinkers of primitive man had in view, and it was this pneuma which had to be carried to all parts which caused the Egyptians to imagine their anatomy. We can find other reasons than that of quenching the fire to make theorists insistent upon the necessity of water not alone to cool the lungs, but to make up the moisture in the humors. Water was as absolutely essential to the humoral theory as air was to the pneumatic theory of physiology and pathology. The lungs were like a sponge. Where better could moisture be given off to the body? As a matter of fact we know moisture *is* given off in the lungs, but the ancients took it for an organ for the absorption not of air alone, but of water as well. It was also for them, as regards water, an organ of excretion, for the author of *"On the Heart"* declares "it departs from the lungs with the pneuma." They knew it was exhaled with the expiration, but some of it went to the pericardium.

They were not far wrong when they declared that here in the heart and its vessels are "the well springs of the human mechanism, the rivers of the body which water the whole of it, which carry life to it, and when they go dry, the man is dead." Correct as this is in its general sense, we have hit upon a singular error more or less deducible from the conception of the heart and its vessels as the well spring of life, where life originated and had its origin. For us it is the pumping station. They knew it was muscle, but for them it was also a reservoir in need of being replenished, and it was natural to think of the pipe bearing to it through the lungs not air alone, but water, and the valves of the heart governed the air admitted to it from the general circulation rather than the fluids, "certainly in my opinion the work of a skilful artisan." The handiwork of God, we acknowledge, but we think we understand a little better how it works, though of course we know the oxygen from the lungs goes along with the blood to the heart and refreshes them and the whole body. They looked on the heart as the seat of intelligence despite the heresy of Alcmaeon, already centuries old, that it was in the

*Gomperz, Theodore: Greek Thinkers, Tr. by Laurie Maginis, Scribner's, 1908-1912, 4 vols.

brain. As Alcmaeon in vain advanced a doctrine which Aristotle refused to accept, so the author of the Fourth Book of Diseases cried in vain: "The drink goes to the stomach and from there it is absorbed by the rest of the body. You must pay attention to what I say; there are so many proofs that the drink passes not to the lungs, but to the stomach." I have suggested from a passage of Euripides (*l. c.*), "Has aught run gurgling through thy larynx?" that possibly the noise of liquid passing through the oesophagus, multiplied by the cartilaginous sounding box of the larynx was also a source of error.

In Plutarch (*l. c.*) the discussion exposes pretty well the theoretical considerations which formed a background to this curious idea, and with them we can readily sympathize, even with the influence of the idea of the animal heat. We have a modern reason for leniency toward the idea that filled the mind of Plato and caused Alcaeus to recommend in the summer heat: "Now drench thy lungs with wine, the dog (star) appears." We do not understand at all how the animal heat is regulated and that alone should make us lenient toward the idea of the ancients that the swallowed fluids helped directly to do it. We have these considerations advanced for the prevalence of this error in the most remote antiquity and its persistence, perhaps in a somewhat modified form, into comparatively very recent times despite even the revelations of anatomy which followed the dissections of Mondino di Luzzi.

The lack of differentiation between larynx and pharynx from a purely anatomical point of view, but chiefly the demand of theory for the access not alone of air to the lungs and to the minutest divisions of the body, whither the vessels go from the heart, but of water as well, was at the back of their minds when they looked upon the pig experiment or on the pericardial fluid, or on the rare demonstrations, faulty enough, of anatomical dissection. Very often their theory is sound. The flesh and the tiny cells of which it is constituted need not the air alone (the oxygen), but the moisture, too. So facts thundered in the ears of humanity many thousands of years before it could see the anatomical channels along which they flowed, open to their unaided vision, which was blinded by a theory, essentially correct.

II. PATHOLOGY.

Just as in the previous section I chose a puzzling theme in the physiology of the nose and throat, very much in evidence in the books of the Hippocratic collection, so here I wish to introduce the subject of the pathology of the nose and throat

in Hippocrates by allusion to a remarkable subject which betrays an ignorance of anatomy and physiology scarcely less remarkable. It cannot be said, however, that a belief in the occurrence of dislocation of the odontoid process of the second cervical vertebrae, in contradistinction to drink going to the lungs, has any further explanation than that of ignorance. We readily understand that a very shadowy idea of anatomical structure and relationship at the base of the skull, entire absence of any knowledge of the very vital functions of nervous matter lying back of the odontoid process, are sufficient to account for any lack of appreciation why the dislocation of the latter might not frequently occur without the supervention of death. There was no overshadowing theory transmitted them by the Nature philosophers standing in the way of their acceptance of this imaginary lesion. The only puzzling thing for laryngologists is the difficulty of conjecture as to what local and general signs of throat disease could have suggested it. Even as late as Littré's time cases seem to have come under observation in which such a diagnosis was made. We are astonished to read (Vol. V., p. 45) Littré's remark made in 1846: "The spontaneous dislocation of the cervical vertebrae is a disease which has only quite recently entered into nosological categories and only a short time ago it was entirely omitted even in the most complete treatises." I cannot run the risk of taking up too much space here in following up the post Hippocratic literature of this idea, so strange to us seventy years later. Suffice it to notice that Adams, writing some years after Littré, is himself rather noncommittal, but refers to Sir Charles Bell* and to the much earlier work of Van Swieten*.

We are concerned here with Hippocrates' description (Epidemics II, No. 24): "The vertebra of the neck made a prominence in front, in some cases more, in others less. Behind the cervical region showed a distinct falling in and the patient complained of pain when the hand touched it. The site of displacement was a little below the odontoid. In some the tumor was very rounded and the periphery was more widespread." Certainly no one could wish for a more detailed description of the external signs. Is it possible that here, as in the throat of the pig who had swallowed colored fluid, the conscientious observer saw something on the outside of the patient's neck which was not there? The practiced laryngologist knows full well that the unskilled practitioner often

*Inflammation and Laceration in the Atas and Vertebra Dentata. Institutes of Surgery, p. 144.
*Comment in Boerhav. Aphth. t. II—de Angina Convulsiva.

sees queer things inside of the patient's pharynx and he will be thrown into less dubiety by the further remark: "Unless the odontoid was involved, in the dislocation, the pharynx was free of inflammation and without participation in the disease." Evidently the author was thinking of some internal or pharyngeal conditions by which he judged of the position of the odontoid. He was evidently drawing a little on his imagination as to physical appearances; honest and objective as he meant to be, a theoretical pathology was vitiating his direct personal observations.

I remember a patient whose attending physician had examined her in my presence the first day he saw her with an influenzal earache. With his thumb he had repeatedly and rather savagely, I thought, pressed on the mastoid eminence without eliciting pain, though some shrinking from the vigor of the pressure. The next day her husband, a friend of mine, told me the doctor had sent her to the hospital because he found the mastoid tender to pressure and he begged me to inquire after her. The otologist had sent me word there was marked mastoid tenderness and he would operate immediately after I had seen the patient with him. Thinking I might throw some light on the mastoid tenderness in time I did not hasten and found myself too late. The surgeon was a little hurried, and by the time I reached the operating table he had a "dry tap" and I fell silent and the patient had an uneventful recovery "without a drop of pus", and all was well. With an odontoid dislocated in the mind of the ancient practitioner, the patient's neck was apt to be prominent and a hollow might be found beneath the occiput and even pain felt there if one only pressed hard enough. What one sees with one's eyes depends very much indeed on the state of the cortical gray matter in the observer's brain when the optical impression reaches it. I am not sure that this jaunty way of treating dignified opinion is entirely satisfactory to the analytical mind in these cases alluded to by Hippocrates, but it is difficult to avoid the obvious when nothing else presents itself.

One is apt to feel like revising this hasty conclusion when one continues to read in the Hippocratic text, "Under the jaws a swelling showed itself, not like an inflammatory tumefaction. No one had swollen glands, but they kept their normal condition. The tongue did not move easily, but it appeared to the patient more voluminous and more pendant. The sublingual veins were prominent. Deglutition of liquids impossible; the drink came through the nose if the patients attempted it. Speech was nasal." Evidently there was *something* the matter with these patients with "forward dislocation of the odontoid." They seemed to have had

little fever and but little quickening of the respiration. "Those in whom the dislocation of the vertebrae was straight and without inclination to the right or the left, these were not affected with paralysis." This sounds orthodox. A man with a dislocated neck ought to show paralysis, whether it was forward or back or lateral, and we are ready to waive any finesse in the diagnosis of the dislocation being just in the median line. We see finesse of that kind yet in the consulting room, but it does not blind us to the essentials. Had then these old doctors really seen a considerable number of cases with dislocation of the neck?

"If there should (hereafter) come to my recollection that any of these patients died I will mention it, but all those whom I recall at this moment recovered." That seems to settle it. Gray's anatomy remarks of this accident in children: "Instant death is the result;" in adults: "It is the mode in which death is produced in many cases of execution by hanging." But Hippocrates observed that his patients retained "for a long time a part of the abnormal projection of the vertebrae," so we are driven back to the effrontery of thinking "a good man gone wrong" again! As to the second category: "But when the dislocation was lateral the patients, to whichever side the vertebrae inclined, were struck with paralysis of that side and contracture of the other. The paralysis was especially apparent in the face (how could that be for cervical injury? But we will return to that later) in the mouth and in the velum palati." We begin to get a glimpse of a syndrome not so very rare, but we know nothing of "the lower jaw showing a like deviation, but the paralyses differing from that of the others, did not extend to the whole body, this effect of the angina not going further than the arm." He had said nothing about that in the cases of the first category. On the contrary, those with the odontoid, limited in its displacement to the median line, he explicitly says, had no paralysis. Things are a little mixed here and he may have been writing without revision. Perhaps he thought he had mentioned the rare cases who, we might have agreed, had really dislocated their necks—total paralysis, no recovery, only those of the first category all recovering with the odontoid dislocated, but keeping in the middle line. We begin to see a little light by giving our author the benefit of the doubt. We think we see a trace of a glosso-labio-pharyngeal paralysis from a lesion of the floor of the fourth cerebral ventricle. Others before it was fashionable to call it a "syndrome," have described such cases, but the cases I have seen of such character had a syphilitic origin and it is scarcely fashionable *yet* to think that syphilis furnished Hippocrates with cases.

This second category of cases "brought up, in the expectoration, purulent matter (those who had the forward dislocation also expectorated). In those who had fever, dyspnoea was present in a much greater degree, drooling saliva as they spoke and showing swelling of the veins; they all had cold feet, but especially the latter, who were also the most helpless in standing up, even when they did not die very promptly. Of all of those which come to my recollection, not one of these has recovered." Some of these were doubtless diphtheritic, some may have simply had a bad sore throat, some may possibly have had bulbar paralysis, as I have suggested, but it must be confessed we have not quite furnished the ancient clinical category with all the modern lesions necessary.

There can be no doubt, however, of the belief of the Hippocratic authors in the cervical dislocation. In *Articulations*, § 41, a very clear appreciation of the lesion of tuberculosis of the spine is apparent, and its connection with pulmonary phthisis is emphasized. "Moreover, these individuals are compelled to hold their neck so there is a projection in front, in the neighborhood of the great vertebra (the Axis), so that their heads do not hang down, and this bone adds much to the retraction of the throat in this sense; in fact, even those who are naturally straight experience by the dislocation of the bone forward dyspnoea until it returns to its place". In *Aphorisms* III., 26, speaking of older children, the author mentions the occurrence of tonsillitis, the dislocation forward of the vertebra of the nape of the neck (note its proximity in the enumeration to throat inflammation), asthma, calculi, etc., etc." In *Prorrhetics* I., 87, and in *Coan Prenotiones* II, XIV, 261, the same wording occurs: "Those who draw in their breath, whose voice is extinguished and whose vertebra is sunk in have at the end the respiration of a man sucking in the air." Clearest of all of a mind evidently occupied with the thought of an entirely supposititious lesion it is seen in the expression of *Aphorism* IV., 35: "In the course of a fever, the neck being seized with a sudden distortion without a swelling of the throat, the case is fatal." The preceding *Aphorism* No. 34 has almost the same phraseology.

Littré in his parting glance at his magnificent work remarks (Vol. X., p. XVII.) in 1861 that Hippocrates described in the Second Book of Epidemics, from which I have so largely quoted, an epidemic of spontaneous dislocation of the cervical vertebra. He then refers again to that part of his own remarks, in Volume V., published in 1846, fifteen years previous to the date of the last

volume (X.), which dealt with references to cases afterwards called glosso-labio-pharyngeal paralysis. As the voice was extinguished in some of these cases of Hippocrates there evidently must have been an involvement of the bulbar origin of the laryngeal nerves, if such was their pathogenesis.

The physiological work of Longet, published in 1841 and 1842, had really elucidated the nature of the lesion before 1846, but it may not have come to Littré's attention when the text of the introduction to Volume V was actually written. This may be the reason that Littré in 1861, in his final remarks, now having become familiar with and seen the bearing of Longet's work, refrains from again mentioning those investigations which in the early years of the nineteenth century had continued the Hippocratic faith "in spontaneous dislocation of the cervical veretebrae."

Littré in 1861 had become very ardent in his endeavors to suggest that the cases alluded to in various places in the several books of the *Epidemics* constitute an account of an Epidemic at Perinthus, a city of the Propontis in Thrace. After a study of the cases as narrated by the Hippocratic author, the modern reader, however, will find no reminder of diphtheria which was suggested to Littré by the publication of one of Trousseau's works. An epidemic of cough, sore throat, nyctalopia followed later by peripheral paralysis, hemiplegias and paraplegias could have been no more an epidemic of diphtheria than there could have been an epidemic of cerebral apoplexy in Thasos, which is suggested in the Hippocratic text of the first book of *Epidemics* (3rd Constitution (§ 8). We understand the relation of muscular paralyses and pareses to these affections, but we know nothing of the other symptoms of the so-called "epidemic." It would seem as though Littré, by grouping cases having something of the same combination of symptoms in various affections having no pathogenic relationship, had created himself an epidemic of Perinthus instigated thereto by the prominence of paralyses in some cases studied by Trousseau* and in some of the cases which, by what seems laborious hypercriticism, he thinks occurred in the Thracian city.

Indisposed as the diagnosis of the early twentieth century is to follow that of the early nineteenth century, either as to dislocations of cervical vertebrae or as to the identity of diphtheria in the Hippocratic collection, there cannot be the slightest doubt that cases of diphtheria, measured by the standard of modern clinical medicine, can be found recorded in it. We cannot confidently say that diphtheria or any other disease entity is noted as occurring

*Trousseau: Clinique Medicale de l'Hotel—Dieu., Paris, vol. I., p. 370.

in epidemic form, unless it is malaria, but individual cases of phthisis, malaria, diphtheria, quinsy, pneumonia, empyema, dysentery and doubtless others which do not at the moment occur to me, we may easily be convinced, were familiar to Hippocrates and the Asclepiadae of Cos and Cnidos. There can be no doubt that some of the cases already alluded to, supposed by the author to be marked by dislocation of the cervical vertebrae, were frank cases of diphtheria. In the book on *Regimen in Acute Disease* we find in the *Appendix* § 6, in the first part of the paragraph, a clinical condition, described with much detail of theory, which may be nothing but an ordinary tonsillitis or pharyngitis or perhaps a quinsy, in the more severe cases. Another Angina, however, is described in which "there supervenes orthopnoea and great dryness; the throat when examined shows no swelling, the tendons at the back of the neck are tense and they seem as though drawn by the tetanus; the voice is lost, the respiration is small; the inspiration is frequent and labored, the larynx (tracheal-artery) is ulcerated, the lung is inflamed; the patients cannot get into their breasts the external air. This kind of angina, provided it does not spontaneously change to the external parts of the neck (?) is more serious and exposes (the patient) to inevitable danger—because of the season and because of the hot and acrid vapors which engender it." There can be no mistaking the symptoms of laryngeal diphtheria in these cases of angina. The accounts of cases which may well enough have been simple sore throats are frequent enough. In the second book of *Diseases*, §§ 9, 10, 11, 26, 27, 28, 32, with the repetitions that, curiously enough, so often occur in the Hippocratic texts even consecutively in the same treatise, give one a fair idea of the inflammations of the throat seen by the old Greeks, and they do not appear to differ markedly from those we see daily, though the interpretations put upon the symptoms exhibit theoretical ideas as to pathology and etiology which are strange enough to us, while the devices for treatment are often stranger still.

§ 9. "Angina arises when the phlegm is put in motion in the head." We know the mucus has an origin just beneath the cullender plate of the ethmoid, but with those sieve holes to drain the base of the skull and the brains spattered out on clubs or stones from the box of the skull the inference was extremely natural for those early men, who learned anatomy from that kind of dissection, that the grayish white stuff put in motion above the sieve would filter down and was the phlegm, and when it was mixed with a little blood, that seemed natural, too. Instead of

wondering at the idea, we should really be astonished to find any other idea existent before the era of elaborate dissection. What should excite our curiosity is that the idea of the cerebral origin of the mucus persisted so long after careful dissection exposed the parts to minute inspection and examination. This again is the trace of "the blight of theory."

§ 11. "The tonsils, the sublingual, the gums and all the neighboring parts become (*infected,* we would say) ill with the phlegm. The phlegm comes down from the head; the head attracts it from the body." Now there was a fundamental idea, closely allied to homeopathic doctrine and historically directly descended from homeopathic magic, which taught that like attracts like. We will find it plainly indicated in the fragments of Empedocles as set forth by Gomperz*, Burnet**, and others. Sweet attracted sweet, bitter drew bitter to it, heat gathered to its site the hot, etc., the grayish white semifluid brain attracted from the rest of the body the phlegm which other tissues in the body possessed; just how it came there is not very clear. Fundamentally distinction had not yet been made between adjective and noun, between substance and quality. Sweetness, bitterness, heat, existed as entities aside from the qualities with which they endowed matter. We have come back in physics to the idea that both matter and its attributes are nothing but modes of motion, but to the ordinary man this is unfelt because his thought heredity has been occupied for many centuries with the discrimination philosophy and physics have made between matter and its manifestations. At any rate, by pursuing the question to such a point we perceive how fundamental is the reason Hippocratic etiology seems strange to us, but even if not we get a glimpse, I trust, of more apparent if less fundamental reasons why for the Greeks the mucus dripped from the brain and infiltrated the tissues. Phlegm and bile, out of place, of course, and out of proper proportion in its combination with other tissue matter, were fertile causes of disease, so we get a pretty coherent understanding of the working of wits in Hippocratic times. We have every reason to know that wits have never in any age of the world been more nimble or more powerful in dealing with Nature's phenomena than in those very times.

The head attracts the phlegm from the body, then, largely owing

*Gomperz, Theodore: Greek Thinkers, Tr. by Laurie Magnus, 4 v., Scribner's, 1908, 1912.

**Burnet: Early Greek Philosophy, London: Black, 1908. Burnet: Greek Philosophy, Thales to Plata. Pt. I. London: MacMillan, 1914.

to these fundamental reasons, some of which I may possibly dilate further upon it with profit, "it attracts it when it is heated. Being heated, it attracts to itself up from the body the thinnest part which, being thus sucked up, descends again into the body." Why should it attract it when heated? This does not appear at all from the homeopathic doctrine of Empedocles. There was another idea of the old Nature Philosophers, just the opposite of that of Empedocles, which we invoked for part of our explanation—the resemblance of the brain to phlegm. According to Alcmaeon and Anaxagoras like does not attract like, one thing attracts another because it is unlike it—a thing is attracted by its opposite—cold things by hot. Now all, or nearly all, the old pathologists agreed that phlegm was cold—the coldest of all the body fluids. In these passages no reason is given why the brain attracts the phlegm from the body except that the head is heated, but there are numerous passages elsewhere in the Hippocratic writings where the doctrine of Empedocles is advanced and once or twice where his name is mentioned, and I believe we have ample reason to believe that the physical resemblance of the brain matter to the phlegm sometimes accounts not only for belief in the cerebral origin of the nasopharyngeal mucus, but for its being, by virtue of the homeopathic principle, attracted from the body.

A belief frequently remains when its original support is removed, and here the reason advanced is more consonant with the doctrines of Alcmaeon, who urged that health was an equilibrium. When a part was too hot, the heat attracted the cold until a balance was struck—at least we are privileged to infer this application of his general doctrine. Anaxagoras was not a very original thinker, but a most persuasive and ingratiating individual, scoffed at by Socrates, but cherished by Pericles and finally driven from Athens, perhaps because the Athenians could no longer stand his talk and yearned after something new, which St. Paul said they were always seeking. At any rate he is supposed to have been influenced by greater men, by Anaximander and Pythagoras and Alcmaeon, among other things in his insistence on the "table of contraries."

By the help of our knowledge of these two fundamental opposing doctrines which ruled the thoughts of men, we catch the drift of them in these passages, but we have to go far afield to find it when we ask what heats the head? However, we find this answer in them: "It is warmed by food and drink, by the sun,

by fatigue"—all of them due to the environment, and to most of them we adhere when we think of the clinical evidence of the way we catch cold—gastro-intestinal disturbance from dietary sins, fatigue due to the exigencies of life, all these we think lower the index of resistance to morbific agents, bacterial or other, and make the head feverish. But another thing is mentioned. The head is heated "by fire"—not in our sense of the expression, for "fire" here stands for one of the four elements out of which all things are made, including the animal body as Empedocles taught —air, earth, water, fire. Fire in its manifestation in the human body was the internal animal heat. The author meant the equilibrium was overthrown, in addition to or in consequence of the action of environmental influences and heat got the upper hand of the cold, which Alcmaeon insisted was the mechanico-biological process of the pathology and etiology of disease.

Thus by following up the indications discernible in the accounts to be found in passages referring to disease of the nose and throat we get glimpses of the doctrines and theories which underly them and which are largely responsible for their appearing strange and incomprehensible to the student of modern medicine alone.

Local Treatment of Acute Rhinitis. J. A. THOMPSON, *Ohio State Med. Jour.*, February, 1919.

The author has had excellent results from the local application of the following prescriptions:

Atropin	gr. ss
Adrenalin	gr. i
Menthol	gr. xxiv
Camphor	gr. xl
Petrolat. liq.	
Ol. amygdal. dulc. aa. q. s.	oz. viii.

THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

February 26, 1919.

DR. E. V. HUBBARD, Chairman. DR. E. ROSS FAULKNER, Chairman.

Patient One Year After Laryngectomy. DR. HUBERT ARROWSMITH.

This patient had been shown before the Section in 1918, a year ago, just after he had recovered from the operation of laryngectomy performed some time in February, and was brought before them again in order that the members might see that he was still living and in good shape. He is doing his work, feels very happy, and is not in the dejected frame of mind that one sometimes hears of.

Dr. Arrowsmith said that a few cases like this and some shown by Dr. MacKenty justify the operation. The results demonstrate that the patient is saved for a life of comfort and usefulness. Dr. Hurd had promised to bring a patient upon whom he had operated with remarkable results. The patient had a good voice and could make himself heard over the telephone. It would be interesting to compare the results in the two cases.

Patient Operated Upon by Laryngectomy. DR. HURD.

The patient was operated upon in January, 1918, and was now presented 14 months later. He spoke in a good voice that could be heard throughout the audience, and stated that he had no difficulty in talking over the telephone and carrying on his business.

Teratoma of Sotf Palate. Presented by DR. ARROWSMITH.

Dr. Arrowsmith said that this condition was sufficiently rare in the air passages to make the case worthy of presentation. The patient from whom the specimen was removed was a man 56 years of age, who for six months previously had been complaining of a feeling of stiffness in his throat, as though it contained some foreign body. His symptoms were relieved by the removal of the growth and he has had no trouble since.

DISCUSSION.

DR. MACKENTY said that he could testify as to the serious character of Dr. Arrowsmith's case. The carcinoma was of good size, not an incipient case but one fairly well advanced. This case illustrated the fact that if these conditions are not allowed to go too far the patient has a fair chance of recovery. It was now over a year since the operation, and the patient seemed to have a fair chance of remaining cured.

DR. YANKAUER asked whether Dr. Hurd's patient had any especial voice instruction or whether he learned to speak by himself.

DR. MACKENTY said that it was most desirable that some properly qualified person should investigate this man's technique and try to develop some method of teaching others similarly afflicted. It was a great pity that Dr. Green, who has charge of the New York speech defect clinic, was not present to hear the man. Dr. MacKenty said that he had never heard anything equal to this man's voice after a laryngectomy. It was truly remarkable.

DR. CARTER asked if there was any glandular involvement in either of the cases.

DR. LYNAH said that Dr. Hurd's case was especially interesting. At the Willard Parker Hospital, it was not uncommon for the patients wearing intubation tubes to be able to speak remarkably with a "pharyngeal voice" that they developed while the tube was in the larynx. In fact they seem to have even better voices than the man presented by Dr. Hurd, as they

are able to get a blast of air through the intubation tube which made the voice audible all over the ward. Often the children were able to fool Dr. Lynah with these remarkable pharyngeal voices and lead him to think that some one of the house staff had removed the intubation tube. The patient presented not being able to get a blast of air through the larynx owing to the tracheal fistula, had a very remarkable voice, and Dr. Hurd was to be congratulated in having been able to train his patient to develop such a pharyngeal voice after laryngectomy.

Referring to the foreign body case of the screw in the right lung reported by Dr. Arrowsmith, Dr. Lynah said that it was always well to have someone assist in these difficult cases, for team work in all foreign body removal was always of great advantage to the patient as well as operator, for after working for a while one's eyes become tired. They had worked for the first time about ten minutes each and as no forceps would hold they desisted. Later the screw was removed by a special pair of alligator forceps. Dr. Arrowsmith advised tracheotomy on account of the massive head of the screw which he was sure would cause great damage if it was brought out between the cords, and he argued that it must have gone in at an angle sidewise to have been able to enter the larynx at all. There was considerable difficulty in entering the isoseles triangle of the larynx with the 5 mm. tube, and as the head of the screw after removal through the tracheal wound measured 7 mm., proved that the judgment of Dr. Arrowsmith was correct as the tracheotomy did no harm to the child, and saved the larynx from undue traumatism which would have occurred had the attempt been made to remove the screw plus forceps by the channel through which it had entered. Dr. Lynah said that he did not feel that he deserved any credit for removing the screw for Dr. Arrowsmith would have removed it had not his eyes become tired.

Dr. Harris said that the subject of laryngectomy is a perennial one; the technique is constantly improving, and the statistics are growing better. To see such cases as had been presented was stimulating. Of course the great question is the preservation of life, and as Dr. Delavan said some time ago, we must reconstruct out statistics. Gluck was unwilling to publish his statistics; and it would be interesting to know Dr. MacKenty's present statistics.

Dr. Harris said that Dr. Hurd's patient certainly had a most remarkable voice. The only similar case he could recall was one presented by Dr. Solis Cohen of Philadlphia, where the patient spoke before the Section and could be heard distinctly across the room. Even in that case, however, the voice was not equal to this one. Dr. MacKenty's suggestion that the method of accomplishing this result be worked out and made available was a valuable one.

Dr. Harris then cited a case he had seen a few weeks previously at Fort Oglethorpe, Ga. A man had been shot through the larynx, with apparently complete destruction of the recurrent nerves; there was almost complete approximation of the cord, yet with his tracheotomy tube occluded he could speak as well as Dr. Hurd's patient. One would not have thought for a moment that he was wearing a tube. Dr. Cohen had explained how his patient was able to phonate, and it would be interesting to know how Dr. Hurd accounted for the excellent voice work accomplished by this man.

Dr. MacKenty said that he did not have his statistics with him but that he had operated on about 31 cases, and a good many of the patients were still living. He operates only on what he considers to be favorable cases. Last year he saw some twenty-seven cases, but operated on only five or six of them. He never operates on a case where it seems certain that there would be a recurrence. In one instance, however, where the condition was far advanced, he removed everything that could be spared in the neck, including the sterno-mastoids. A subsequent infection caused considerable sloughing before the wound was closed. That was three years ago and the patient is still alive and working at his trade as a mechanic. This case was regarded as inoperable, although the growth

had not extended over the arytenoid behind but had involved the neck. Posterior arytenoid involvement is more serious than involvement of the neck. An advanced case operated upon eleven months ago was reported by his physician in Cuba to be still doing very well. Another case was operated upon in 1912 and is still alive. That was an incipient case. It is not fair to boast of cures when one is only operating on very hopeful cases. Of these cases 40 per cent are still living after from one to six years. There is a great chance for these early cases. It is not right to preach against operating in cases of cancer of the larynx, and it is to be hoped that some of our noted laryngologists will revise their opinions on this subject.

DR. HURD replied that in the first place most laryngectomies are performed upon older and generally less intelligent men. This patient was only 39 years of age when operated upon and is now only 40. About four weeks after the operation he told the man that he would probably have a voice. The first proposition was to give him a cigarette. He was first instructed how to develop his pharyngeal muscles, by drawing well and then blowing. After receiving these suggestions he would stand before a mirror and he worked it out for himself from the instruction I gave him on the fundamental principles of speech. He was simply told that he could do it; he wanted his voice back, and he recovered it. Ability by his mentality and determination. A week ago he had been presented before an audience in Husack Hall downstairs and could be heard perfectly all over the hall.

The man has not developed any pharyngeal pouches, and it is difficult to look down his throat; it goes down like a V, and there is nothing there at all. When he gags it shuts up tight. He can count easily up to twelve, and that requires a pretty good amount of air. Replying to an inquiry as to whether it was made by the esophagus, Dr. Hurd replied in the negative. It was done altogether with the tongue. The esophagus apparently had nothing to do with it.

Coin Removed from the Esophagus of a Child. DR. ARROWSMITH.

After the child had swallowed the coin, the parents continued to feed it, and at operation Dr. Arrowsmith thought at first that the esophagus was very edematous and had difficulty in exposing the coin. After feeling around with the forceps, however, he discovered the coin beneath a mass of material covered with mucus, which proved to be simply a mass of food that the child had not been able to swallow. The coin was removed without further difficulty.

The patient, a child two years of age, was first seen three days after it had inhaled a number eight flat head steel screw, an inch and a quarter long. The plate herewith presented is unusually clear.

The glottis was so small that it was impossible to pass the 5 mm. bronchoscope. Through the 4 mm. tube the screw could be seen and grasped by the forceps, but owing to the edema above it, it could not be budged.

A second attempt was made three days later, Dr. Lynah being present, but after twenty minutes' unsuccessful work it was decided to postpone further efforts.

After a week's rest for the patient we again did upper bronchoscopy, but the screw seemed immovable; so a tracheotomy was done and a 5 mm. tube introduced. The bronchus was dilated and the edema dissipated to some degree and after several attempts by each of us, Dr. Lynah succeeded in withdrawing the foreign body in the grasp of a rather heavy alligator forceps.

The plate shows the screw apparently not more than three-quarters of an inch above the diaphragm. Its head is greater in diameter than the outside measurement of the 5mm. bronchoscope, which could not be passed through the glottis, so that even if it had been possible to dislodge the screw it seems impossible that it could have been withdrawn through

the glottic aperture without considerable traumatism, probably enough to demand tracheotomy by reason of subglottic edema.

There was some injury inflicted during the extraction and the first few days were somewhat stormy, but the child is now perfectly well. The tracheotomy tube was removed in two weeks and the wound closed in forty-eight hours. Fortunately such cases are rather uncommon. It was one of the speaker's most uncomfortable experiences in tube work.

DISCUSSION.

DR. YANKAUER said that it was a long time since he had removed a foreign body from the trachea or bronchus, but the case recalled to him one in which a child had inhaled an upholsterer's tack with a large brass head; in that case there had been a similar edema of the tracheal mucous membrane between the bronchoscope and the foreign body. Th condition was very similar to this one, excepting that the foreign body was harder to remove than this, having a large head, which it was very difficult to get through the narrow part of the passage, but by working it sideways and moving the bronchoscope from side to side, and getting first one edge a little forward, then bringing the bronchoscope forward, then bringing the other edge forward and making slow and steady traction it was finally brought out. One encounters very great difficulty in working on such small children, and Dr. Arrowsmith was to be congratulated on his success in this instance; one should not hesitate to perform a tracheotomy in such a case. It is much better than to run the risk of causing a subglottic edema from the long-continued presence of the tube in the glottis and the difficulty of moving the tube from side to side.

Dr. Yankauer then told of an experience in removing a couple of checkers from a soldier who had swallowed them. The checkers were an inch and a half in diameter. After removing some pieces of food, he found these big things and could hardly grasp them with the forceps, but finally succeeded in getting first one and then the other. While in France he used the bronchoscope a number of times in treating cases of gas poisoning and for the treatment of post-pneumonic infiltrations, and for diagnosis.

DR. ARROWSMITH, in closing the discussion, said that in the laryngectomy case the glands were not affected at all and he had made no attempt to remove them.

As a matter of record, he wished to report on a patient whom he had presented before the Section early in November—a boy 22 years of age from whom he had removed an epithelioma by thyrotomy. Dr. Arrowsmith said that as a rule he does not approve of this, but considering the age of the patient it seemed only the fair thing to do, and up to date he is doing well. The operation was done about four months ago. Dr. Lynah assisted at the operation and coincided in the decision not to do a complete operation. The patient's voice is good, being only a little rough.

Bullet Wound of the Mouth. Presented by DR. HURD.

The patient was accidentally shot at the Pennsylvania Station, and was dressed at the hospital at 5 a. m. The bullet passed through his jaw and knocked out his right bicuspid teeth, passing through hard palate, jumping across mouth and anterior behind the left tonsil. . . An x-ray picture was made, but not a stereoscopic view, and the bullet was found to be located under the angle of the aw. It appeared to be behind the pterygoid process. Many of these cases where bullets entered from the face have become infected and the patients have died. This man was shot in the morning and the search was made for the bullet that afternoon. It was a case of resecting the jaw or making an incision at the angle of the jaw feeling for the bullet. The styloid process was very long and it was very difficult to get at the bullet. Finally the house surgeon got his finger in and jammed the bullet back into the mouth through the wound. The bullet had loosened first bicuspid, first and second molars and second bicuspid lower. The track of the bullet was carefully examined and it seemed clean and all right. A few days later first upper bi-

cuspid had to be removed. It seemed to have been infected; and three weeks later it was necessary to open up the wound and take out first and second upper molars because the alveolar process had become softened. The concussion of the bullet had evidently devitalized the bone. A stereoscopic x-ray is almost necessary to get a good view.

DISCUSSION.

DR. HARRIS said that cases of bullet or shrapnel wounds of the face are very interesting. He had seen five such cases and had operated on three, all with extensive involvement of the antrum. In one case both antra were involved,—in one case the bullet coming out of the mastoid. It is very difficult to locate the pieces of shrapnel. In one case two pieces of shrapnel were removed from the nose.

DR. ARROWSMITH said that the case presented by Dr. Hurd recalled a case seen some five or six years ago. A man had shot himself on the right side of the neck, evidently with a pistol held more or less perpendicularly, and the bullet went through his tongue and did not emerge. The family physician did an immediate tracheotomy and took the man to the hospital. The bullet had evidently cut the lingual artery on that side, and the patient would have suffocated had it not been for the tracheotomy on account of the enormous swelling of the tongue. He was carefully watched for a day or two, and after the swelling of the tongue went down no trace of the bullet could be found. An x-ray was taken and the bullet was located in the antrum. It was removed, but it was impossible to locate the point of entrance into the antrum. The teeth were not injured and there was no apparent wound anywhere. He made a good recovery, but died six months later of apoplexy.

Nasal Deformity. Presented by CAPTAIN H. H. FORBES, M. C.

The patient was a young girl who first came under observation several years ago, with a history of trauma, showing a marked bony protuberance just back of the left nasal bone, and a scar on the right side at the angle of the orbit, for which she sought relief.

Dr. Forbes operated, using the scar on the right side as the starting point, and working beneath the ski nto the left side and back to the left nasal bone, removing a splinter of bone at that point five-eighths of an inch in length, and about the circumference of a good-sized match. There was bony attachment at one end, and periosteum covered the piece of bone.

The patient was not satisfied with the result of the operation, and a second operation was done by another surgeon. An incision was made on the left side, and an attempt made to reduce the deformity, but this was unsuccessful, and was followed by a constant lachrymation from the left eye.

An interesting point was, notwithstanding the removal of the tear sac following the second operation, there was no improvement in the tearing, and none of the eye men consulted by her gave her any encouragement in regard to having the gland removed. Someone, however, finally persuaded her to have the gland removed, and now she is relieved of the tearing, but still wishes to have the nose brought into better shape, and hopes that something may be done to remove the bony deformity, and improve the shape of the eye opening. Since the operation the condition has greatly improved, and it seems at this time, almost foolish to attempt anything further. It might be possible to go in through the nose and shave off a part of the deformity due to the bone condition, but this would not remedy the almond shape of the eyes or the dissection of scar may be all that we can attempt.

DISCUSSION.

DR. HARRIS said that it was a question whether any bone removal would have any effect on what was disturbing to the patient,—the apparent excess of tissue at the inner canthus. If the displaced nasal process were removed, would the redundant tissue at the corner of the eye still remain? It was an exceedingly interesting question in a young girl.

DR. BRUDER said that the mother stated that the girl was more worried about the scar than the deformity on the other side. She does not worry about the projection of bone but wants the scar removed. There is an eye condition, which is a congenital deformity, epicanthus, not unlike this one, where the eye deformity is caused by the excess of tissue,—and a plastic operation may be done to correct it. If this scar were cut out and the skin undermined, it would serve both purposes,—correcting the condition and removing the scar. The man who removed the tear sac was altogether on the wrong track, for tear sacs are removed more for conditions where the tear sac suppurates,—never for an overflow. When patients come with a suppurating tear sac that we can remove the suppuration but the tearing persists. Occasionally the lachrymal gland is removed, but generally the patients come back complaining of dryness instead of the tearing; they are between the devil and the deep sea.

Leprosy. Presented by DR. UNGER.

DR. UNGER said that he presented the patient because it is rather rare to see a beginning leprosy lesion in the nasal mucous membrane. The cutaneous condition had existed for some months, and the nasal lesion appeared before that. The nasal mucous membrane showed little tubercles like those on the face and hands. The diagnosis was confirmed by section and smear.

Round-Celled Sarcoma of the Nasal Sinus in a Child of Seven. Presented by DR. MACKENTY.

DISCUSSION.

DR. HURD asked if anyone had ever seen a case of aspergillus mould in a sinus. He had recently had under observation a woman patient with a prevailing cold in the head. Transillumination showed the left antrum dark. Irrigation revealed no pus, but the return fluid showed white flakes; the solution put in a glass of water looked like cotton fibre. It was examined and found to be aspergillus mould. That was three weeks ago. The antrum had been washed out twice with dichloramine-T and alcohol many times, nothing has proved of any avail. Could anyone suggest any method of relief?

DR. YANKAUER said he had never seen aspergillus mould in the sinus but had seen it in the ear, where it had penetrated Shrapnell's membrane and invaded the attic. He washed it out for a long time; it took over a year to clear up the condition, but finally the aspergillus disappeared and the membrane healed. Aspergillus mould is exceedingly difficult to get rid of. He had found a solution of salicylic acid and alcohol the most effective remedy.

At Base Hospital Number 3 in France Dr. Yankauer was given charge of a case of a man who had a shrapnel wound in the back of the knee which refused to heal. It finally developed, on looking up his record, that he was also being treated in his ear clinic for aspergillus in the external auditory canal. Immediately a diagnosis of aspergillus infection of the wound was made, and a mould was found in the wound, although it could not be identified as aspergillus. Bichloride and salicytic dressing was used and part of the wound healed, but it was not entirely closed. The man was finally sent back to the States and was lost sight of.

Bone Transplantation the Ideal Method for Correction of Saddleback Nose. W. W. CARTER.

Abstract of Dr. W. W. Carter's Paper:

Bone and Cartilage Transplantation the Ideal Method for the Correction of Saddle-Back Nose.

This paper was inspired by the writings of those who still cling to the idea that a semi-rigid splint composed of some foreign substance, such as rubber, celluloid, silver, etc., introduced into the tissues of the nose can be made to fill in the deficiency or support the tissues of a depressed nasal bridge in a position of normal elevation and to maintain that elevation indefinitely. Dr. Carter stated that the fallacy of this contention

had been conclusively demonstrated by a number of the most experienced and skillful surgeons. Almost any foreign substance chemically neutral to the fluids of the body, if aseptically introduced, could be made to heal in, and it would remain if it had no resistance to overcome (in which case it would be of no service) and if the bodily health of the individual could be maintained in a state of perfect preservation (an incredible proposition). It must be recognized that there is a difference between mechanical results physiologically secured, as when the autogenous bone and cartilage transplant is used, and those secured by means which ignore the laws governing the vital processes in the tissues, as when foreign substances are introduced.

The autogenous bone and cartilage transplant meets perfectly the conditions necessary for the permanent correction of nasal deformities due to the destruction of bony and cartilaginous framework.

Dr. Carter prefers the rib because it is conveniently shaped, is well supplied with nutrient foramina and is unusually rich in osteoblasts. A segment of the rib is easily, quickly and safely removed. In no instance has Dr. Carter experienced the slightest difficulty in securing the transplant nor has the operation been followed by complications of any kind.

Dr. Carter showed a number of x-ray lantern slides demonstrating the growth of the transplant at different periods after the operation. He also showed photographs of a number of patients whose deformities had been completely corrected by bone and cartilage transplantation and explained the variations in his technique necessary to produce the desired results.

DISCUSSION.

CAPTAIN H. H. FORBES, M. C., U. S. A., asked whether Dr. Carter had given up the external incision, and did he prefer rib to tibia and that periosteum should be preserved. He then referred to Dr. Weir's early efforts in correcting these nasal deformities, and described how Dr. Weir had in 1889 employed the breast-bone of a duck for this purpose.

A number of men about this time were using bone fragments to fill in bony defects, especially in the tibia, and one or two had used bone plates in hernia cases. Results were far from satisfactory and for a time all efforts in this direction lapsed until the development of the present technique. My own experience wtih periosteum covered bone would lead me to continue its use.

DR. DELAVAN corroborated what Dr. Forbes had said about the great ingenuity of Dr. Weir in correcting these nasal deformities, who had employed many media in the attempt to restore the nose. He also recalled that on one occasion Dr. Thos. T. Sabine performed the first operation of its kind in New York City upon a large, handsome young man at Bellevue who had lost the entire nose. Dr. Sabine used the middle finger of the man's left hand to supply the place of the nose for him,—the result was bad, for it remained very evidently a finger, and the man became an object of curiosity and derision, to such a degree that he became so discouraged that he committed suicide. This method has been employed occasionally in other cases, but it has never been a success for obvious reasons. The artist depends upon light and shadow to produce his pictures, and all progress is measured by contrast. It would be difficult to imagine any greater contrast to the case quoted above than the splendid results submitted by Dr. Carter, who was to be congratulated for the great advance he has achieved in this important department.

DR. CARTER, replying to Dr. Forbes, said that he had practically discontinued the use of the incision between the eyebrows, for it not only seems much safer to introduce the bone through the nose, but that method eliminates the scar and lessens the liability of infection. He has seen much less infection by doing the work through the nose than by the older method. Staphylococcus albus penetrates the deeper layers of the skin and is apt to cause infection when the incision is made between the eyebrows; moreover, you have the drainage at the highest point, and that is undesirable. Where the transplant is put in through the nose, the opening for drainage is at the most dependent portion of the wound.

He had had no trouble with any of the cases of transplantation through the nose.

Dr. Carter said he had been much interested in what Dr. Delavan had said about the early method of using a finger in making a nose. That method should be abandoned, for the man not only loses a finger but it does not make a good nose; and if the nail bed is not destroyed the nail will continue to grow and the result is very unsatisfactory. If a man has no nose the best method is to transplant the bone first into the arm, and afterwards to transfer the flap containing the transplant into the face. The bone will grow all right if it is contacted with live bone. It is vitally important, however, that it should be contacted with live bone, for that is whence it gets its impulse of growth. The results are very much better where there is firm, bony union with the skeletal bone.

SECTION ON OTOLOGY.

Meeting of February 14, 1919.

DR. JOHN LESHURE, Chairman. DR. JOHN D. KERNAN, Secretary.

A Device for Controlling Haemorrhage in Operations on the Lateral Sinus. Presented by DR. JOHN R. PAGE.

DISCUSSION.

DR. W. M. BRIEN presented a somewhat similar instrument devised by Dr. Wells P. Eagleton for the same purpose, which had been used with satisfactory results upon some of his cases.

Cerebellar Abscess; Operation; Recovery. DR. LAURANCE SAUNDERS.

This was a case of cerebellar abscess secondary to thrombosis of the lateral sinus. The patient came under observation April 6, 1918, complaining of severe pain in the ear and giving a history of indefinite discharge for some time past. The lower part of the ear looked sclerotic, but Schrapnell's membrane was red and bulging. Schrapnell's membrane was opened, the patient being told however that this might not prove sufficient. The next day she said the pain was better, but two days later she came to the office suffering much pain. She was urged to go to the hospital for a radical operation, but this she was loath to do. Going home in the cab she had a chill and her temperature rose to 105°. She finally consented to go to the hospital, where the diagnosis of sinus thrombosis was made. The vein was taken out and a hasty radical operation was performed, and the dura over the sinus exposed. Before the antrum was opened a small amount of pus seemed to seep through the bone, and on exposure of the sinus the dura was seen to be covered with fibrin and pus. On opening the sinus there was free bleeding from both ends. The blood culture taken at time of operation was negative. The vein was sectioned and streptococci were found in the walls of the vein.

The patient did fairly well for a week or ten days, although the condition was never entirely satisfactory. After about two weeks, the headache increased, and she became somewhat stuporous; this condition was characteristically intermittent, one day the patient feeling fairly well and the next day her mental condition being clouded and complaining of headache. The condition grew steadily worse, and suspecting an intracranial complication, Dr. Lewis was called in consultation. We decided that the patient had an intracranial abscess. The diagnosis of cerebellar abscess was based on the fact that at the previous operation the cerebellar area was exposed, showing fibrin and a small amount of foul pus. At the time of the second operation, which was three weeks later, the patient was entirely unconscious; the wound was reopened and the cerebellar area exposed . . . anterior and posterior to the sinus which had been obliterated at the previous operation. There was no microscopic evidence of the fistula, but it was decided to explore in front of the sinus; and fortunately at the first exploration the abscess cavity was entered three-eighths of an inch beneath the surface. It was about the size of a walnut, and filled with creamy pus. This was palpated with a cottontipped applicator, and

was found to extend downward and backward underneath the old sinus area. A three-quarter inch opening was made, two cigarette-drains put in, and the usual dressing applied. The patient was returned to bed, and twenty-four hours later she was perfectly rational and the headache had disappeared.

On the second day after the operation she again had a slight headache, and when the wound was dressed and the cigarette-drains removed a considerable amount of pus welled out. The drainage did not seem sufficient, so the cavity was again palpated with a cotton-tipped applicator and explored backward and downward; it was then laid open its entire extent, after which the patient did perfectly well. The cavity seemed to be obliterated by a gradual eversion of its lips, and gradually disappeared.

The patient after this made an uninterrupted recovery. The ear is now dry, though twice since the operation she has complained of discharge. On account of the necessity of saving time, a large plastic flap was not made, and for that reason there was not as good control of the radical cavity as there would have been otherwise. The labyrinth has not been accurately tested, but this will be done later, as well as the past pointing tests. There is some hearing in the ear, however.

Case of Epithelioma of the Auricle: Operation; Defect Covered by Plastic Operation. DR. LAURANCE SAUNDERS.

The growth was located just behind the auricle, and was treated at Bellevue for some time with the x-ray, with no apparent result. The patient dated his trouble back three years, beginning from a mosquito bite, and stated that he had a running sore for three years.

When he first came under Dr. Saunders' observaeion, there was an indurated ulcer the size of a dime behind the ear. A section was taken and it was pronounced to be epithelioma.

At operation the growth was excised with a margin of about half an inch around, leaving a denuded area behind the ear and on the posterior surface of the auricle elliptical in contour and about the size of a half dollar. The upper part of the incision was sown together, leaving a defect below. This was covered by a plastic flap formed by making an incision downwards and backwards from the posterior and lower part of the elipse and by an incision downwards and slightly forwards from the lower part of the elipse. When undermined the flap thus formed was easily pulled up and sutured in position. It healed by primary union excepting in one place, where the flap slipped a little, leaving an area to be epidermatized.

The patient was operated upon in January, and the area is perfectly healed. This is much better than leaving a large defect the size of a half dollar on both the posterior auricle and the surface of the mastoid to heal by epidermitization.

DISCUSSION.

DR. LESHURE said that Dr. Saunders was to be congratulated on the results of the operation in both cases.

DR. FRIESNER inquired the date of the operations in the first case.

DR. SAUNDERS replied that the date of the second operation was approximately three weeks after the first, which was performed on the 10th of April.

DR. FRIESNER said that that was about ten months ago. The point he wished to bring out was that in these cases of brain abscess, and particularly in cerebellar abscess, the case cannot be considered as cured unless there are absolutely no symptoms for at least six months. He had seen a case of cerebellar abscess quiescent for almost that length of time after operation and drainage, yet later the patient succumbed to a recurrence.

DR. PAGE said that Dr. Saunders had spoken of the case before the New York Otological Society, and the question of obliterating the sinus had been brought up. Dr. Eagleton spoke of it; at the same time he showed the instrument for controlling the hemorrhage, and spoke of obliterating through the sinus and not trying to avoid the sinus. The instrument was devised to aid in that object.

DR. SAUNDERS said that the report to which Dr. Page had referred was very brief, but that he had been impressed by the ease with which this abscess in particular was evacuated after the cavity was obliterated. Should he have another cerebellar abscess to operate upon, he would first obliterate the sinus before attempting to evacuate the abscess, unless it should be an extremely urgent case. Very often in these brain cases there is too much traumatism done to the brain tissue itself. One of the reasons why this patient recovered was that the abscess was evacuated with very little traumatism. Probably adhesions formed between the brain substance and the dura before the brain abscess was formed. It was also fortunate that it was near the surface.

Another interesting point was learned later. The mother stated that during the previous winter the patient had had attacks of headache in which she was very irritable, almost morose; which gives reason to believe that this was an acute exacerbation of an old condition. Unfortunately, the patient had been advised against operation, and that made the case very difficult to handle. In fact, he had disclaimed all responsibility for the case in view of the fact that she had refused operation when he had urged it; although later she came and requested it.

Dr. J. M. SMITH said that about a year ago he had seen a somewhat similar case in a negress, a fracture extending across the mastoid. When first seen, the patient was unconscious. The spinal fluid was negative. She had a traumatic mastoid following a fracture, and instead of doing a mastoid operation, the cortex was removed. The condition cleared up and the patient left the hospital. About two months after the operation she returned to the clinic; she had had a Jacksonian fit. A second operation was performed, revealing a large tempero-sphenoidal abscess. It was a tempero-sphenoidal instead of a cerebellar abscess following a fracture. Dr. Smith said that they had had still another case, and later he would report the two together.

Report of a Case of Cerebellar Abscess Secondary to Otitis Media Acuta: Thrombosis of Lateral Sinus. Cerebellar Abscess with Specimen.
DR. L. M. HURD.

The patient was brought into Bellevue on November 10, with a vague history of having been waylaid and beaten. He was a Russian, but spoke some peculiar dialect, and no one could be found to interpret for him. When admitted to the hospital there was a depression of the left occipital bone, and he was bleeding from the right ear, nose and mouth. He was evidently an alcoholic. A tentative diagnosis was made of fracture of the base of the skull. The next morning his spinal fluid was taken and was found to be normal under pressure and bloody. Blood pressure, 138; diastolic pressure, 176. Six days after admission he had another lumbar puncture; and a chill. The man remained in the medical department, unobserved by any ear man, from November 10th to the 23rd.

He was turned over to the ear department on Saturday about eleven o'clock, in a comatose condition. The x-ray showed no fracture of the vault.

Dr. Hurd said he first saw the patient late Saturday night, being then in a state of coma. The canal was filled with pus. The right mastoid was indurated around the ear to the angle of the jaw. At that time the pulse was 76; respirations, 22; rectal temperature, 98.4°.

He was operated upon on the 23rd,—comatose, and with nystagmus, for this plainly apparent mastoid condition. The mastoid was opened and was found to be badly broken down. The sinus was uncovered and was hemorrhagic, badly congested, and thickened. There was not so much fibrin on the dura, the condition looked like blood underneath the dura. The sinus was exposed back to and behind nearly to the torcular without reaching normal dura. Then it was opened up and the incision extended almost to the torcular before a good flow was obtained. It was opened downward as far as practicable, and the jugular tied off. The patient's condition went from bad to worse while on the table, with a pulse of 76; five hours after the operation it was 135.

The condition looked like an acute labyrinthitis at that time, and also a cerebellar abscess or clot on the dura. There may have been a fracture at the base, but there was no evidence of it, excepting this bloody exudate under the dura.

For two or three days after operation the patient was drowsy and could not be aroused; he had nystagmus for a couple of days. The temperature went up the next day to 101, and see-sawed across the normal line, until the 23rd, when he died.

While the patient was in the medical ward the picture would have led to the belief that he had had a trauma and fracture; but they paid no attention to the ear and let the condition go on to a bad sinus thrombosis and cerebellar abscess.

Two days after the operation the blood picture was 17,400 whites and 86 polys. He was in a drowsy state for three days and then began to improve; got out of bed and was walking around, and his general condition improved daily, and it was thought worth while, as long as the temperature was never normal, to let him wall off the abscess if he could. He went on, and from all the signs that could be elicited,—not being able to have any conversation with him,—seemed to be doing fairly well. He complained of no headache, no indication of hemiparesis,kinods, kinesis, and no past pointing, but had ataxia, a tendency to sway over as he walked toward the lesion, and a tendency to fall toward the lesion. He suddenly fell over and died; an autopsy showed a ruptured cerebellar abscess. They did not report any fracture of the skull.

In reply to a query from Dr. Saunders, Dr. Hurd repeated his statement that they had been unable to get any previous history from the man, on account of not being able to find an interpreter for him. At operation the mastoid was found to be all broken down and soft inside.

DISCUSSION.

DR. SAUNDERS asked if at the time of autopsy any pus was found in the cerebellum. On looking at the specimen, it had more th eappearance of a rupture of the brain tissue itself than of an abscess cavity.

DR. HURD replied that at autopsy they tore the cavity downward. There was no tear over the area of the dura over the cavity, and the autopsy report was ruptured abscess. At the time of the operation he had the impression that there was a cerebral haemorrhage rather than an abscess.

DR. FRIESNER said that it would seem that the presence of blood in the fluid suggested fracture. Most cerebellar abscesses of otitic origin are in the anterior half of the cerebellum. It is rather unusual to see an abscess of otitic origin in the location of this specimen.

DR. HURD replied that the patient gave the symptoms of unconsciousness, bleeding from the nose, mouth and ear. He had not seen the case until the patient went all to pieces. Then the ear was filled with pus, there was a typical bad mastoid, apparent sinus thrombosis, and jugular involvement.

DR. PAGE said that Dr. Friesner's point was well taken, in regard to the location of the abscess. The case was certainly strongly suspicious of fractured base. One would have thought the autopsy report would have said that there was or was not a fracture.

DR. LESHURE asked if there was not a possibility of its being a case of cerebellar haemorrhage due to the injury and possible fracture of the skull. The blood clot might have become infected and thus had the appearance of fluid pus. The haemorrhagic appearance of the dura would point to this possibility.

DR. ALFRED KAHN, looking at the specimen, said that the cavity in the cerebellum looked as though it was of long standing, unless of course, it had been made after removal. He did not think it an abscess cavity. It did not show any sign of haemorrhage. He wished to make a point—referring to the diagnosis of cerebellar abscess—the diagnosis was usually made indirectly through differentiation. The first sign of brain symptoms usually directed the otologist to three or four things. He would think of the possibilities of jugular involvement, basilar meningitis, menin-

gitis causing brain tension, causing pressure in the lateral ventricles. In jugular involvement there would be the differentive blood count; in meningitis the spinal fluid would differentiate, leaving only true brain involvement to be considered. Of brain involvements, tempero-sphenoidal conditions are more frequent. Symptoms and signs: slow pulse is characteristic of brain involvement. Vomiting is characteristic of cerebellar involvement. Nystagmus, in Dr. Kahn's opinion and the opinion of others, is often characteristic of cerebellar involvement. The nystagmus often had certain peculiar characteristics, which might differentiate it from direct semi-circular involvement. As to nystagmus associated with cerebellar abscess, there seems to be a marked difference of opinion. He has heard it stated here that the cerebellum had nothing to do with nystagmus. Judging from the opinions of what might be considered authorities on the subject, and in his own opinion, Dr. Kahn was inclined to think it had.

DR. HURD, in closing the discussion, said that according to the earlier hospital history, the man had vomiting. That cleared up and there was no vomiting while the patient was under his observation. He had only a rotary nystagmus for two or three days, which left him after that. He had drowsiness for four days, and later on a tendency to fall toward the lesion. As he could not speak English, nothing much could be learned. All the tests that could be made by signs and motions were negative.

DR. FRIESNER said that Dr. Kahn had not made his meaning clear, for so far as nystagmus is concerned, as a means of differentiating lesions in the cerebellum from those in the tempero-sphenoidal lobes, it must be remembered that neither the cerebellum nor the tempero-sphenoidal lobe has anything to do with nystagmus.

DR. KAHN said that Dr. Friesner had before mentioned that in his case of cerebellar abscess there was no nystagmus, but that is different from the opinions expressed by other writers. Others have pointed out that you do have nystagmus, and that this nystagmus may be present even though the labyrinth is out of commission, and that therefore the nystagmus must come from the cerebellum.

Replying to Dr. Kahn's statement quoting Jones and others, to show that nystagmus must come from the cerebellum:

DR. FRIESNER replied that that was not necessarily so, as it might be due to edema of or to pressure on the brain stem.

A Case of Meningitis Associated with Otitis Media Chronica; Symptoms of Cerebellar Abscess: Peculiar Phenomena on Exploration.

DR. JOHN D. KERNAN.

This patient was a child of five years admitted to medical service at Bellevue Hospital, December 11th, 1918.

Family and previous history of no significance except for earaches two years previously.

Present History: About three weeks ago baby had a cough and was feverish, probably influenza. In ten days was well. Three days ago patient became feverish and indisposed. Two days ago began to vomit everything, even water.

Physical examination on admission, practically negative. Especially to be noted that the neck was not stiff, knee jerks were normal, mentality was clear.

Medical examination was gastritis.

Notes in Hospital.

December 14, Examination of ears:

Large perforation in left M. T. and a small amount of serious discharge without odor. Could not make out any mastoid tenderness. The right M. T. is slightly red over posterior, superior portion, but no bulging. This ear should be kept under observation and if it does not clear up should be incised. Irritable. Hypersensitive. Neck somewhat rigid. Koenig's sign doubtful. Lungs clear.

December 17: Patient quiet. Not irritable. Answers questions, at 9 a. m. Patient's head rotated to the left. Would not answer questions.

Quivering of left upper arm and lip at 9:35 a. m. At 10:15, patient seen in convulsions, left arm and lower lip twitched involuntarily and were spastic. Involuntary twitching of left side of face, head and eyes twisted to left. Left foot rotated inward. No Koenig or Babinsky.

Notes in Hospital.

Neurological on the 19th: Eyes, pupils dilated, regular, do not respond to light.

Monoplegia left arm, spastic.

Contraction.

Reflexes	Right	Left
Biceps	x	xx
Triceps	—	x
Knee	xx	xx
Ankles	x	x
Clonus	x	x

Abdominals absent on left, diminished on right.

Child does not respond to suggestion, findings not satisfactory.

Nystagmus probable.

Left facial paralysis probable.

December 19: Leucocytes, 26,400. Number of cells counted, 300. Polynuclears transitionals, 89. Lymphocytes, 14; large mononuclears, 0. Eosiniphiles, 1.

December 19, Spinal fluid: 23 cells; 8 cc. cloudy fluid, little pressure; 10 cc. antimeningitis serum given.

December 20, Spinal fluid: 10 cc. cloudy fluid under little pressure; cloudier than yesterday; 10 cc. antimeningitis serum given.

December 22: Smear shows many giant diplococci.

December 25: No. 7559 blood culture sterile.

On account of vomiting, nystagmus and paralysis a mastoidectomy, and exploration of left cerebellar hemisphere was decided upon.

Operation: Usual incision for mastoid.

Simple mastoidectomy, small amount of foul material in antrum. Bone clean.

Bone over sinus removed then with rongeuts dura over cerebellum front and behind sinus exposed.

Cerebellum explored with narrow bladed knife. A gush of gas on incision. No abscess found.

The question arises: Was gas due to spinal puncture or to action of bacteria?

DISCUSSION.

DR. CARTER told of a somewhat similar case which he had had under his care in the spring of 1917. He had been unable at the time to find anything like it reported in the literature.

The patient was a very strong, robust Russian, 32 years of age, who gave a history of middle ear suppuration dating back two years. He had had repeated attacks of running ear preceded by a great deal of pain, the discharge having a very foul odor. Two days before admission to Dr. Carter's service in Gouverneur Hospital, he had had a chill, followed by vomiting and fever. On admission he had a temperature of 102, tenderness and a beginning bulging over the mastoid; this swelling extended with remarkable rapidity over one side of his face and head after admission to the hospital, so that one eye was completely closed. The auditory canal was completely closed, and one side of the face had the appearance of erysipelas, except that it did not have the distinct line of demarcation of erysipelas nor the color. It had a sort of purplish color. There was a fine crepitus over the entire side of the head and over the mastoid antrum there was a fluctuating sensation, though it felt more like air than fluid.

A mastoid operation was performed, and when the incision was made through the skin the blood that came from the wound looked as though it was charged with gas, and it was; as soon as the knife went through the periosteum there was almost an explosive discharge of gas, which sent a grayish, foul-smelling fluid almost to the ceiling. The odor of the

gas was something frightful; the house surgeon said it possessed the same characteristic odor of all the gas cases they had had in the hospital. There was a large round perforation over the mastoid antrum, and the whole of the mastoid process was filled with a cholesteatomatous mass. A simple mastoid operation was performed and counter-openings made in two or three places on that side of the head. There was so much subperiosteal elevation from the gas and pus that the openings communicated easily with each other.

At the time Dr. Carter thought they were dealing with the Welch bacillus, and on the principle that it is an anaerobic bacillus which loves light, oxygen and hygienic conditions even less than it does antiseptics, he used, not an antiseptic solution but a normal sterile saline solution, making the openings very free and keeping them open with gauze drains. The patient's temperature dropped in twenty-four hours, and he got well.

Dr. Carter said that he hesitated at first to attribute the condition to the Welch bacillus, for most of these cases terminate fatally; but a culture was made by a competent pathologist and the Welch bacillus was thoroughly identified. The bacillus is very large, it measures about five micromillimetres in length and its diameter is about that of the anthrax bacillus; most of them were found in pairs. Besides the Welch bacillus staphylococci and streptococci were found; there was quite a mixed growth of bacteria.

The point of special interest was the question of how the Welch bacillus found entrance into the wound. There was no external wound, and it must have gotten in through the Eustachian tube or through the perforation in the drum during the long continued otitis media. Ordinarily one thinks of the bacillus being introduced through an abrasion which has come in contact with the soil.

Dr. Kernan's case was probably not infected by the true Welch bacillus, for he stated that only giant diplococci were found. It must be remembered that a number of saprophytic bacteria are gas producers, and it might have been a saprophytic bacterium that caused this condition, but more likely air was introduced when the spinal injection was made. One would think that gas bacillus infections would be more common than they are in the mastoid, for it would seem that an old, foul cholesteatomatous cavity would present ideal conditions for the development of anaerobic bacteria.

Dr. Bruder cited a case of meningitis seen in consultation a year ago. The family physician stated that the patient, a child, had had an attack of sore throat followed by swelling of the joints of upper and lower extremities. At times the temperature went up so high that it seemed as though it would break the thermometer, going at times to 108. The swelling of the joints disappeared, but the temperature remained high. Dr. Bruder was called in consultation because of an extensive swelling about the mastoid, extending down to the shoulder. He found the canal occluded. The child was very sensitive and had a temperature of 106, and it was impossible to make an examination. He advised exploration of the mastoid, which was agreed to, and on opening the ear found that the mastoid tip had perforated and the child had a perisinus abscess, with a cellulitis extending from the mastoid to the shoulder. The temperature immediately dropped from 106 to 103, and varied for a week or ten days. She also had an acute endocarditis, and acute nephritis. The urine was examined by Dr. Dixon, of the New York Eye and Ear Infirmary, and it was thought that some of the temperature was due to the nephritis. As the condition went on without the temperature coming to near normal, an examination of the blood was made and Dr. Dixon reported pneumococci in the blood. The (spinal) fluid by Dr. Dixon was also examined and was found to be very cloudy, but before the report was received the child had several convulsions and went into a coma. Dr. Saunders was then asked to see the case in consultation, and it was decided to do a decompression operation; the dura was exposed but there

was no pulsation; incisions were made into the brain but nothing was found; and the child was returned to bed.

Then Dr. Dixon reported meningococci in the spinal fluid, and Dr. Bruder got into touch with Bellevue, where they have been administering meningococcic serum, and the child received this treatment for two or three days.

(During the time the child had developed convulsions she had a double choked disc, though when the eyes were first examined they had been negative.)

After four or five injections of the antimeningococcic serum the child made a complete recovery and left the hospital at the end of ten weeks, with heart, kidneys and every other condition clear.

Dr. Bruder said he did not know how to account for the history, but it had occurred to him that she might have had acute cerebro-spinal meningitis with involvement of the joints, which is not uncommon, and then had the other complications which kept the temperature going; and at the hospital when it was thought she had developed an otitic meningitis she had a relapse of the cerebro-spinal meningitis.

Dr. Saunders said that they were justified in performing the exploratory operation at the time. The child was unconscious and had symptoms of meningitis; and although they had been unable to get the report on the spinal puncture, she had a history of mastoid which had existed for an indefinite time. It seemed good judgment to explore the case, and if confronted with a similar case at another time he would do the same thing. In justification of the exploratory operation, the patient recovered.

Tonsillectomy in Myositis and Arthritis. H. I. Lille and H. R. Lyons, *Jour. A. M. A.*, April 26, 1919.

The authors summarize the results of their observations and the reports of the patients' condition as follows: (1) It is justifiable to advise a tonsillectomy in every frank case of myositis or arthritis. (2) A marked improvement may be assured from tonsillectomy alone in 79 per cent. of all cases. (3) It is necessary to remove all possibility of dental sepsis; by so doing a larger percentage of patients will be improved. (4) The duration of the myositis or arthritis is a factor in the ultimate results, although benefit and even complete cure is obtained in some long standing, chronic cases. (5) Forty per cent. of the patients with chronic myositis or arthritis who are invalids will respond favorably to tonsillectomy. (6) The size of a tonsil has no bearing on its possibility as a focus of infection. A careful expression of the tonsillar crypts and a history of throat trouble associated or not associated with the myositis or arthritis is essential in the diagnosis. (7) An absence of a history of diseased tonsil in no way eliminates the organ as a focus of infection. (8) A clean tonsillectomy, with the removal of the plica tonsillaris, is necessary in every case.

PHILADELPHIA LARYNGOLOGICAL SOCIETY.

Stated Meeting, Wednesday, April 2, 1919.

Cadwalader Hall, College of Physicians.

PROGRAM.

Dr. W. O. LaMotte: "Case of Elongated Stuloid Process Extending into the Tonsillar Fossa."

Dr. J. Clarence Keeler: "Case of Idiopathic Epilepsy Found to be Due to Empyema of the Antrum of Highmore; Operation and Recovery."

Dr. P. Samuel Stout: "Laryngeal and Rhinological Experiences at a Base Hospital." In this clinic the cases were divided into Infectious and Non-infectious cases. The number of patients averaged 35. Acute cases consisted of Tonsillitis, Peritonsillar Abscesses and Pharyngitis. In one week a case of Measles, a case of Mumps and one of Diphtheria were sent down to the clinic. The Shick Test was used with favorable results. Of the Chronic cases the following were seen: Hypertrophied Tonsils; Rheumatic Cases; Elongated Uvulae; Tuberculous, Luetic Cases and Diphtheria Carriers. As to treatments, all operations were performed under local analgesia. Novocain in one-tenth per cent strength was used for infiltration, while 10 per cent was used for topical applications. Patients were kept in the ward from 10 to 15 days. For Vincent's Angina, Trichloracetic Acid was used, and for Tuberculous Cases Lactic Acid. Luetics were sent to another ward. Hypertrophied, embedded and diseased tonsils were operated upon soon.

Dr. Robert F. Ridpath then took up the humorous side of the work, and extemporaneously gave his personal experiences of a civilian physician entering a new field of work. He first described the difficulty and red tape necessary to go through before entering and the work entailed in closing his office and arranging his practice while away. His trip to Alabama and Camp Sheridan was quite an experience and was vividly described. Dr. Ridpath then went through the routine of a day's work which was approximately as follows: Paper Work of the Army. In this work the history in detail and physical findings were recorded. Here also one would have to examine the soldier from every angle, even though his work previous to entering the army may have been only along special lines. After this came dinner time and from two to five o'clock the clinic was held. During this time also the operations for the next day were prepared for the following morning. At five o'clock a major would lecture upon, for example, Troop Leading or Map Reading. After supper the time was practically your own. A few words were mentioned of the work during the "Flu Epidemic:" First of all, the officers were moved from their quarters to tents and barracks. In the six weeks, there averaged 5,000 cases daily. The hospital had accommodations for 2,000 and there were 1,000 tents. The wards were used for the Pneumonia cases, Meningitis and Scarlet Fever and Surgical cases. Myringotomies were a most common procedure, Dr. Ridpath having but one acute Mastoid during the epidemic. Nasal hemorrhage was very common and at times quite severe. The bleeding came from the anterior end of middle turbinate and from the floor of the nose. A radical mastoid operation was performed upon a case of cerebellar abscess following otitis media. There were a number of frontal sinus (acute) cases. Of the other work performed there was one Killian for frontal sinusitis, five radical antrae operations and a number of submucous resections.

Under the discussion of the above papers, Dr. Keeler stated that while in service an elongated styloid process was the cause of breaking a No. 9 wire loop during a tonsillectomy. Dr Ridpath quoted a case of a young woman who came to his office complaining of foreign body and lump sensations in the throat following tonsillectomy, which symptoms ceased after the correction of an elongated styloid process. Dr. G. Alexander mentioned a similar case.

HERMAN B. COHEN, *Reporter.*